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SUPPLY AND DEMAND IN THE LABOR MARKET: personnel development, organizational-behavioral aspect, forecasting

Edited by Prof. Olga Savchenko

In the framework of the project 530278-TEMPUS-1-2012-DE-TEMPUS-JPHES «ICo-op»: «Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation»

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The book is prepared by a team of authors within the framework of the international TEMPUS Project «ICo-op». The book is dedicated to the study of the features of tools to focused demand and supply in the labor market. The authors summarized Ukrainian and foreign experience of studying processes related with the peculiarities of research leadership and entrepreneurship in the context of human capital. Particular attention is paid to the development of professional competence of future engineers and productivity already operating engineers and technical staff. The problems of development of methods and models of personal development, forecasting labor market needs based on professional competency profiles are considered. For students, researchers and teachers of universities and for enterprise managers, entrepreneurs-innovators.

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CONTENT

INTRODUCTION

The inventor, the scientist and the engineer – they are the true heroes of any economic revival.

Of course, it is hard to say how a country can create such an environment. But it would obviously be a good thing if society found its true heroes, rather than following hyped up false models.

Ukraine is the fifth most populated country in the European continent. Sustainable progressive social-economic development of the country, its leadership position in the external market is ensured by the developed "knowledge generation" environment. The latter is based on the significant sector of fundamental research, availability of effective educational system, developed innovation system as well as state policy directed to the innovation stimulation.

At the same time, the main aim of engineering education is preparation of a competent specialist. His/her main characteristics should include competitiveness on the labour market, high qualification, responsibility and awareness of the related areas. Besides, he/she should develop the ability to work effectively due to the major and correspond to the world standards. He/she should be ready for the constant professional advancement, social and professional mobility in present-day conditions.

Scientific-technical policy of Higher Educational Establishment should be focused on the development of research (all teaching staff should be involved in the research process) and research-production activity. It should have its own scientific-innovation policy and create electronic information-educational environment at the University.

According to the experts a wide introduction of modern informational-education technologies into the engineering education practice has been restrained by the lack of software products and worked out didactic and methodological recommendations of most engineering majors.

Educational innovations do not appear themselves, they are the result of scientific research, advanced pedagogic experience of some university employees and entire communities.

Pedagogic innovation is the innovation in pedagogic activity such as changes in the content and technology of education and training having the aim to increase their efficiency.

In the developing educational system the innovation processes are being implemented in the following directions: formation of the new educational content, development and putting into practice of new pedagogic technologies, creation of new types of training activities; transition from the quality-based model of a graduate to a competence-based one.

Educational process is a complex dynamic education-system, which covers motives – goal – tasks – content – forms – methods – results. Competences such as knowledge and skills of work with modern hardware and software including the technology of remote devices application in laboratory cycles of various disciplines should be foreseen among expected results of students' education. Besides, the educational process should be based on modern Internet technologies.

Modern state of labor market demands constant improvement of staff competence in any enterprise. Thus, the principle "Lifelong education" should be widely carried out. It is obvious, that working population does not always have opportunity to be present at the educational centre physically, but at the same time, practically each person has modern means of communication, including Internet.

Development of modern educational system is conditioned by the influence and introduction of information and communication technologies (ICT) into all activity spheres of educational establishments and, to a great extent, owing to the possibility of a free access to Internet technologies. These processes predetermine considerable changes in traditional approaches to educational process.

Development of e-learning has become a modern direction for a technical university. Development and implementation of e-learning is carried out through the integration of different education forms (full-time, part-time, computer-based, net-based) directed to the systematic, organized process of knowledge and skills accumulation with the help of e-learning devices.

In many European countries e-learning development predetermines the progress of career development system for the educational staff. The advancement of educators' proficiency level in the field of Internet technologies and application of different e-learning forms contributes to the development of international cooperation in the educational environment.

Actual problems of scientific-technical progress could be frequently solved only by the application of very complicated, complex and unique research installations or research installation complexes created as a result of the cooperation between several institutes from around the world and operated simultaneously by a large team of

specialists, programmers, technicians, managers, economists etc. The exception here could be the devices, which are not so expensive or have complex production, but are unique in terms of technical ideas and fulfill unique functions. The availability of such unique devices and installations in universities could serve as an indicator of the development level of any research school or technical industry.

Project TEMPUS ««ICo-op»: Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation (530278-TEMPUS-1-2012-1-DE-TEMPUS-JPHES)» is aimed to "deliver" high-quality education into Armenia, Georgia and Ukraine within the concept of remote access laboratory.

In general, the transfer tendency to the non-traditional education forms could be observed in the increasing number of universities in the world that train with the application of new information technologies including distance education systems (DES).

Project research is focused on the educational environment of partner-universities, regional labour markets and identification of employers' needs in the development of certain engineering competences.

Thinking ahead … In conditions of global competition, human capital is the foundation of investment attractiveness of a country.

The prospect of further research in this direction is to regulate structural proportions in the labor market, including between the sphere of employment and education sector, and what is expedient to direct further research.

Ukrainian labor force is characterized as highly qualified and skilled, the level of labor pay is much lower than in developed countries.

The labor market in Ukraine evolves gradually and increasingly become oriented toward such industries as tourism, entertainment, and leisure. Today, more than half the national labor force is involved in the service sector.

Current political and economic instability has led to rapidly increasing labor migration, in which both skilled and unskilled workers leave the country in order to find more reliable sources of income.

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Chapter 1

GLOBALIZATION AND THE LABOR MARKET

1.1 System approaches to formation of supply and demand in labour market

The present stage of recession of economy development in Ukraine is characterized by changing priorities of economic development, which is change of the purposes and methods of management. One of the main management subsystems is the subsystem of a workforce management. Workforce in Ukraine is object of social management.

As the object of social management, a workforce have the features as they act as producers and consumers of spiritual and material benefits, and their role constantly increases in economic and social progress. Feature of a workforce management in the conditions of uncertainty consists in need of the accounting of interests of citizens and society.

System approach to studying of labor market as part of research methodology, has arisen in 20-30 and has gained further development in 60-80 of the twentieth century. The essential contribution to research of system approach has been made by such scientists R. Akoff, V. Afanasyev, L. Bertalanfi, A. Bogdanov, I. Blauberg, A. Doktorovich, V. Lektorsky, V. Sadovsky, V. Sekretaryuk, J. Forrester, F. Emery, E. Yudin, etc.

O.V. Volkova, O.A. Grishnova, V.A. Gnevasheva, G.I. Mimindusova, S.V. Ryazantsev, V.A. Shershnova, I.V. Filimonenko researched labor market. However, despite existence of scientific researches and publications, the problem of studying of system approaches to formation of supply and demand in labor market is insufficiently investigated.

To investigate application of system approach to studying of labor market and a workforce management, system approaches to formation of supply and demand in labor market. To allocate the factors influencing on dynamic of supply and demand in labor market. To propose measures of macroeconomic and microeconomic regulation of labor market, a measure of microeconomic work regulation in education market.

On the essence system approach, according to V.G. Afanasyev, is characterized

by set of such interconnected aspects:

- system and element which opens the components of the system;
- system and structural, showing the internal organization of the system, the interaction process of its components;
- systemic-functional, answering the questions what functions are carried out by the system and its components;
- system and communication which opens horizontally and vertically interrelation of this system with other systems;
- system and integration, opening the mechanisms, factors of the improvement and development of the system;
- system and historical which answers the question how did the system work, what stages it has passed in the development, what its historical perspective.

System approach – the direction of the methodology of scientific knowledge, which is based on the consideration of the object as a system: a comprehensive set of the interconnected elements; set of interacting objects; set of entities and relations.

System approach is approach where any system is considered as the set of the interconnected elements (components) having an exit (purpose), an entrance (resources), communication with external environment, feedback. The essence of system approach consists in implementation of requirements of the general systems theory according to which each object, in the course of his research, has to be considered as big and difficult system and, at the same time, as an element of more general system.

Labor market – category, first of all economic. Therefore priorities of its research lie in the field of economic sciences.

There are many definitions of labor market:

1. Labor market is a system of the economic relations between workers and businessmen with the corresponding mechanisms, norms and institutes providing realization of labor.
2. Labor market is a sphere of sellers and buyers contracts of labor services. There those who wish to work (including employed and unemployed) and those who employ workers for goods and services production resist each other.
3. Labor market – the economic relations concerning purchase and sale of labor. it is characterized by the free movement of labor between the enterprises, branches, regions and emergence of unified price of work the same quality and quantity.

4. Labor market is an expression of concrete systems of public organization wage labor in the conditions of the commodity-money relations and provides market economy functioning on the operation basis of the supply and demand law.
5. In this specific market, labor market, laws of supply and demand also work, the purchase and sale of labor can occur in the conditions of the perfect and imperfect competition, the peculiar price of "balance" counterbalancing supply and demand in labor market is established.
6. Labor market represents cumulative supply and demand of labor and due to interaction of these two components provides placement concerning workplaces of economically active population on spheres of economic activity in the branch, demographic and professional qualified reserves.

The concept "labour market" is more often used as a synonym of the concept "market of labour". However there are also other views. Divergences in treatments of these concepts of domestic and foreign researchers proceed nowadays. Supporters of the term "labour market" claim that the labor can't be sold as conclusion of agreement requires obligatory preservation of a personal liberty of the hired worker. The main supporters' objection of the term "market of labour" is that work can't be object of purchase and sale. As one of the private markets, it is used in the context of the general theoretical approaches to the market problems within formation in world science of a new economic paradigm. In line with its discussion in domestic literature new approaches to understanding of economy, its social role in society development have appeared.

First of all, it is possible to allocate system approach as conceptual vision of the place of the economic relations in the system of the set of the social relations and interrelations.

Considering management of workforce as system and as a component of management of social and economic development of society, it must be kept in mind that it belongs to the class of the big and difficult systems which main signs are existence of a significant amount of the interconnected and interacting subsystems and elements subordinated to the common purpose. From the point of view system approach labor market represents the difficult system of the public relations having a number of subsystems, segments, and sectors and including diverse internal and external relations. At the same time labor market is a subsystem of the cumulative or integrated market of production resources. Unlike other production resources (means of production, the earth etc.), work very specific resource – it, for example, can't be a

storage subject, it is closely connected with subjective sectors of production, with valuable personal characteristics of the worker etc.

In the integrated market of production resources labor market occupies not just special, but also defining place, because the process of production can't take place, and society can't function normally outside the employment of people.

In the most integrated look the control system of workforce includes three subsystems:

- the first – formation of a workforce for the purpose of satisfaction the requirement of national economy for qualified personnel and compensations of physical and spiritual abilities of labor;
- the second – distribution and redistribution of workforce – for the purpose of providing full (or maximum) employment of working-age population, optimum distribution and redistribution of labor;
- the third – use of a workforce for the purpose of effective consumption of labor for the production of the necessary material and spiritual benefits.

The first subsystem – formation of workforce. All other phases of labor reproduction depend on her normal functioning. From that, for example, how quality and quantity qualified personnel will be prepared, depends efficiency of use of workforce.

Management of a workforce formation begins with management of population policy.

The effective mechanism of planning and forecasting of need of modern economy for workforce of various qualifications is necessary for effective functioning of the second subsystem – management of distribution and redistribution processes.

Now the special attention has to be paid to the solution of problems of vocational training, professional development and retraining of qualified personnel according to the changing labor demand.

Implementation of the following actions is for this purpose provided:

- monitoring and forecasting of labor market, needs for shots of certain professions and specialties;
- orientation of vocational training to training in the professions and specialties providing competitiveness of workers in labor market;

– transition to the regional and branch principle of planning of need for training workers and experts in establishments initial, average and higher education;

– providing a flexible entrance and leaving the system of professional education according to requirements of labor market and the personality;

– system formation of a continuous vocational education, including training at a workplace, development of self-training opportunities;

– a solution of the problem of adequate response to reforming a system of educational services in connection with changes in labor market;

– system improvement of effective professional. preparation the adult population on the basis of the public educational institutions;

– rapid response to the change of the demand and offer level of labor, for the purpose of coordination supply and demand on educational services in vocational coal mine.

Functioning of a third subsystem assumes creation the effective mechanism of planning, selection and an assessment of efficiency of labor potential use, both certain workers, and their set. And there are no obvious techniques of an assessment of labor potential yet; there is no common approach to quantitative representation of this potential.

Figure 1.1 depicts links between subsystems of a workforce management.

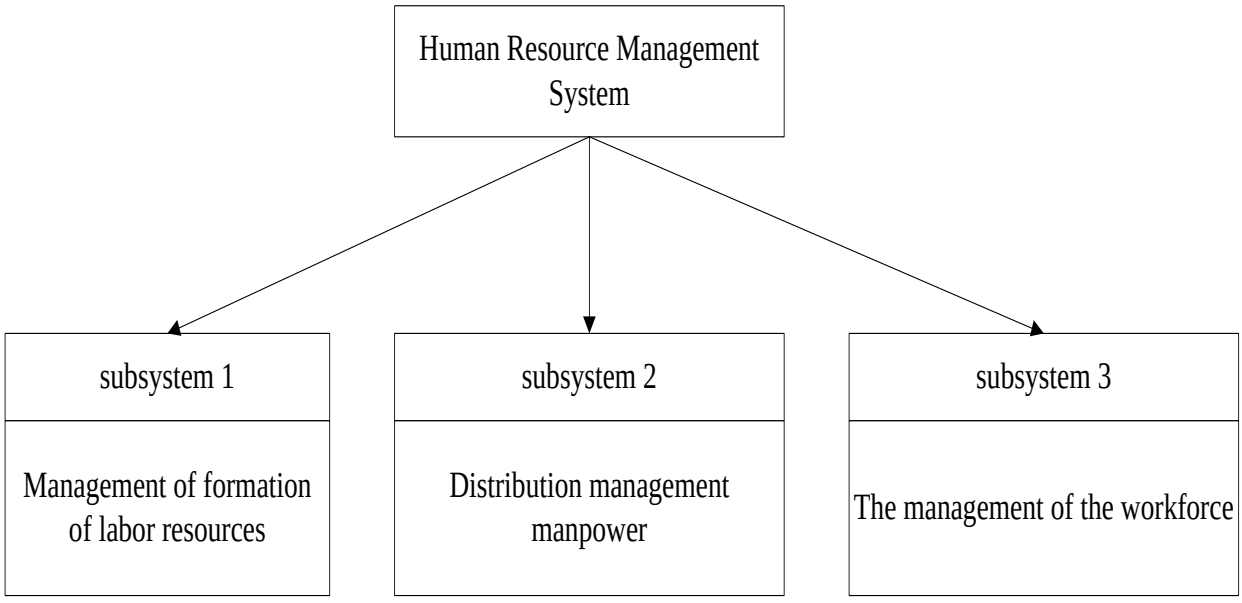

Fig. 1.1. Links between subsystems of a workforce management

At system approach to formation of supply and demand in labor market the fluidity and variability of components properties of the regulating system, continuous changes in external environment, interaction of the elements among themselves and with other regulators of economic system, its separate subsystems have to be considered.

The control system of a workforce is rather versatile and efficiency of its functioning depends on many factors. Conditionally the control system of work can be divided into three hierarchical levels, proceeding from basic elements of the human recource management in the allocated subsystems (fig. 1.2).

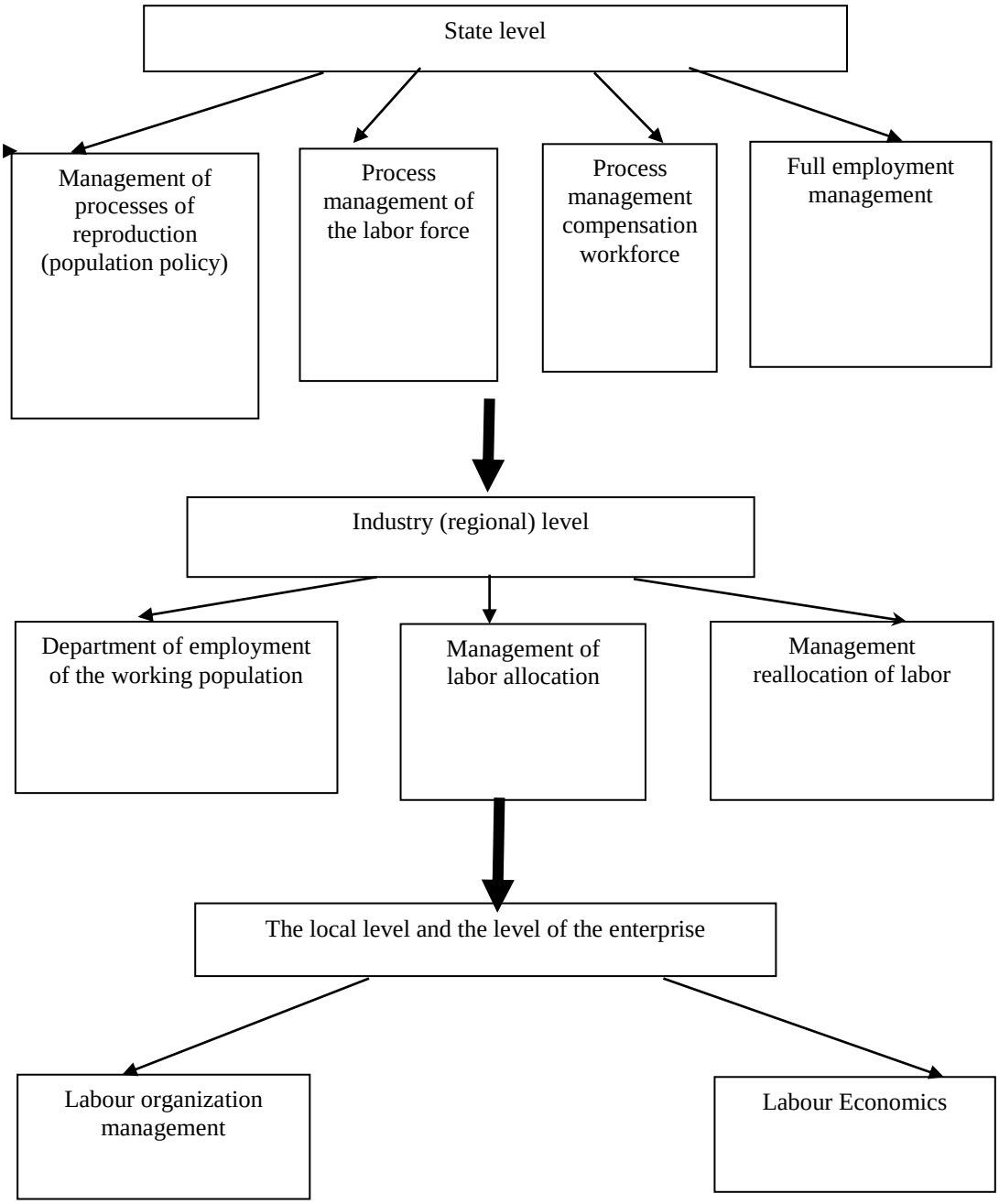

Fig. 1.2. Hierarchy of the workforce management

Thus, the common goal of all control system of a workforce consists not only in effective consumption of labor, but also in its effective training, allocation and reallocation between branches of economy, in their unity and interconditionality directed to achievement satisfaction of material and spiritual needs of society and each its member.

Management levels of workforce – state (macroeconomic), branch, local, the level of the enterprise. Of course, management of workforce on the scale of national economy, branch, area or the enterprise has the features which find expression in object and methods of management. One thing to operate workforce at the level of branch and the territory, another – at the level of association and the enterprise.

System approach to management of workforce assumes accurate differentiation of activity content, the rights, duties and responsibility between governing bodies of different levels and divisions of each control link. Certainly, all control system of workforce is under construction on the basis of knowledge and use of requirements of the objective economic laws existing in our society in the conditions of market economy.

The control system of workforce has to develop and be improved constantly.

Functions, methods and the organization of management change according to growth of productive forces, scales of economy, the purposes. The solution of again arising tasks constantly demands entering of these or those amendments into separate elements of a control system.

Labor market in Ukraine is at a development stage with all features inherent in this period. Long development of labor market demands new approaches to the sphere of the social and labor relations considering specifics of the Ukrainian economy. It is about the accounting the nature of changes of branch structure employment, segmentation of labor market on ownership forms and the status of employment, about considerable scales of the hidden unemployment, growth of employment in shadow sector of economy, low labor mobility, etc. All this demands the comprehensive analysis not only quantitative, but also qualitative parameters of these real phenomena. Also corresponding division of powers according to employment management, between the state and local authorities is necessary.

Indeed, Figure 1.3 shows the factors influencing on dynamics of the supply in labor market. The factors influencing on dynamics of the supply in labor market are represented in fig. 1.4.

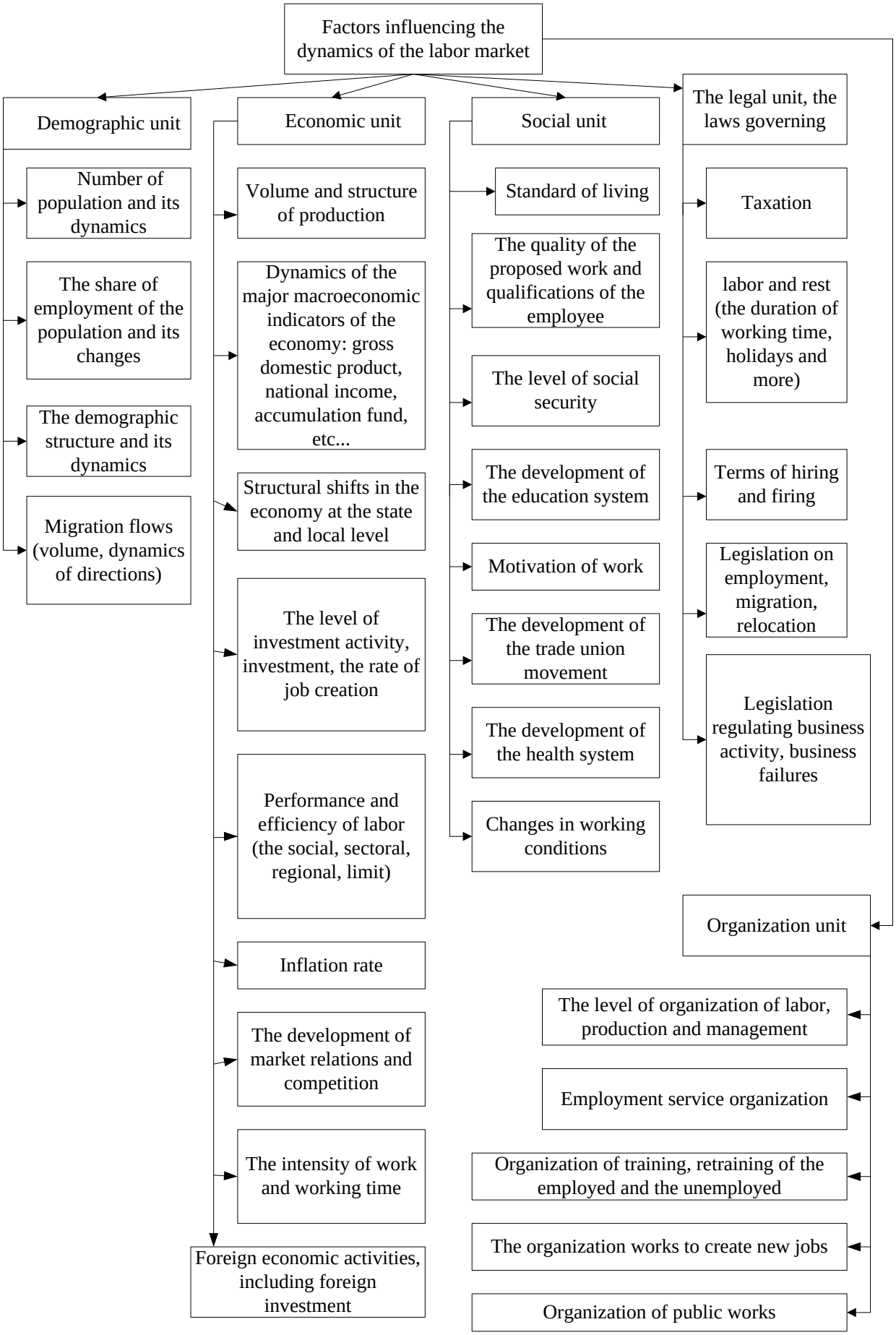

Fig. 1.3. The factors influencing dynamics of the supply in labor market

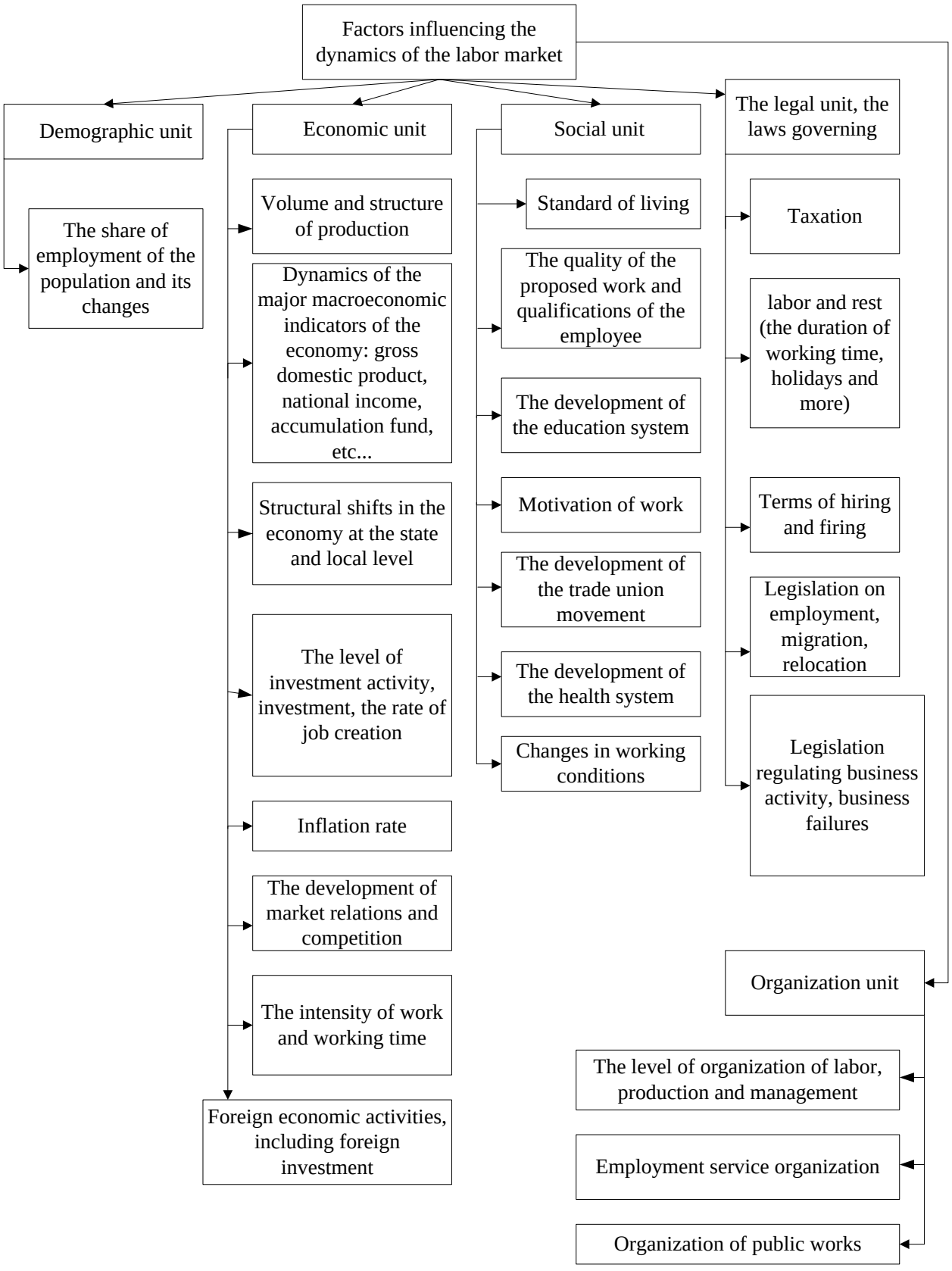

Fig. 1.4. The factors influencing dynamics of demand in labor market

Has great theoretical and applied value of profound scientific justification the solution of employment problems and labor market of Ukraine. Employment as a condition of productive forces, has to have dynamic balance between demand for work and its supply. On the other hand, employment is not only interaction of demand for work and its supply, but also a certain combination type of public and personal factors of production. The last factor represents social essence of employment, reflects need of the person for self-expression and for satisfaction material and spiritual needs through income gained for the work. Proceeding from it, employment as social and economic category characterizes various forms of participation of working-age population in socially useful activity.

Demand for work is the derivative demand that is derivative of final goods and services which are produced using this resource. It means that stability of demand for work will depend from: labor productivity during creation of goods; the market value or the goods price produced using this resource; labor costs; possibilities of work replacement with other factors of production.

The majority of factors influence both demand, and the supply in labor market, as a rule, in an opposite direction.

The work price also depends on this or that ratio of supply and demand. If demand for work exceeds the supply, then the work price in labor market grows.

If, on the contrary, the work supply exceeds demand, then the price of work reduces. The most essential shifts between supply and demand of labor come as a result of changing the market conditions during the transition periods from one business cycle phase to another. So, during the periods of revival and economic recovery when the new enterprises open, acting enterprises extend and, therefore, demand for work grows. Significant increase of the work price can be result of it. On the contrary, when economic recession begins, the enterprises are closed, production of goods and services is reduced, and the part of labor is excessive and is pushed out on free labor market. Demand for work reduces, the supply of work grows. As a result falling of the work price.

Market condition changes not only due to the movement of phases of a business cycle, but also is constant – in the course of the competition. Therefore the change in the work price under the influence of market conditions in the conditions of free competition also happens constantly. Balance of supply and demand in labor market – an exception, not balance – the rule.

The theory of supply and demand in labor market well explains the reasons of the changes of the work price in the conditions of the perfect competition, however it doesn't give an irrefragable answer on a question how it develops and what the equilibrium level of a salary at compliance of supply and demand depends on. It is obvious that the workers selling a resource of the work apply at least for such price of work which provides the welfare accepted at present and in these conditions. On the other hand, employers can't pay such price which would exclude a possibility of receiving profit and normal functioning of production for work. Thus, the certain objective size which is the cornerstone of the work price which has received the name "costs" of labor is formed.

Labor cost, unlike the cost of other goods, includes historical and moral elements. It depends on the cultural level of the country which is historically died quality, performance level of social activities, and also organization, force and historical claims of hired workers. Changing the cost of labor and after this also the work prices, can be as a result of growth of public labor productivity, acceleration of scientific and technical progress, development of material and spiritual needs of the working population.

Thus, dynamics of the change the work price depends not only on a ratio of supply and demand of work, but also on the movement of the labor cost. The work price is in a sense expression of labor cost. It receives the further specification in the category "salary". Labor cost, eventually, is reduced to the cost (price) of a subsistence of the worker and his family necessary for ensuring activity of the worker, restoration of his working capacity (reproduction of labor), satisfactions of necessary material, spiritual and social needs. Are included in the labor price of skilled workers also costs of their vocational education and professional development.

Balance of a workforce as measure of macroeconomic regulation of labor market. Formation of a workforce balance with emphasis on studying in the course of calculation the balance of three phases reproduction process of a workforce, namely formation, allocation and use. The third phase — use which assessment allows to create the supply of labor corresponding to demand on the volume and quality is of special interest.

Measures of microeconomic regulation of labor market. Forecasting of employment in branches, economy sectors, the separate enterprises for the purpose of determination of demand for volume and quality of labor in the medium-term

prospect sufficient for vocational training of a workforce, for the purpose of formation the supply corresponding to the volume and quality of labor. The possibilities of forecasting applied at the separate enterprises will allow to increase efficiency of employment, to create the structure of employment meeting real requirements of production of the organization.

Measures of microeconomic regulation of education market:

— development of the system of training according to the Bologna convention taking into account professional structure and volume of the competences necessary for national economy;

— development of the system of "continuous education" including and uniting all professional standards of labor in a uniform complex. Integration of training centers of labor will allow to provide more effective distribution of resources and to exercise control on formation the supply of labor on the basis of expected demand for it; and also interaction with employers in system of the integrated forms of labor market and education market;

— development of system of the educational credit guaranteed by the state and also systems of grants on professional education of big competitive advantages;

— development of the competitive environment in the sphere of the higher education due to formation and development of the integrated forms of interaction of labor market and education market with employment guarantees at compliance of quality and volume of the labor requested by the potential employer;

— formation of selective system support of professional education due to development of practice of the state order for training of specialists;

— development of the students knowledge assessment indicators in higher education institution by means of carrying out annual monitoring of students.

Thus, it should be noted that:

1. The analysis of labor market, system approach to studying of labor market and management of a workforce, system approaches to formation of supply and demand in labor market is carried out.

2. The factors influencing dynamics of supply and demand in labor market are allocated. Measures of macroeconomic and microeconomic regulation of labor market, action of microeconomic regulation of the work in education market are proposed.

3. Formation of a new type of economic growth in Ukraine and other Eastern Europe countries is towards the creation of "human" economic mechanism focused

on the development and accumulation of human wealth as the overall of the active, productive abilities of the individual.

1.2 The interaction of the labor market and education academic area

The idea that new technologies have accelerated the pace of sectoral change in employment from manufacturing to services, as well as a shift from unskilled to skilled labour within sectors, appears to offer a very direct link with the structural problems of contemporary labour markets. In particular, the bias in contemporary technologies towards a more intensive use of knowledge inputs is seen to favour skilled workers, simultaneously raising their productivity relative to that of the unskilled.

Skill-biased technological change has, in recent years, been associated with the increasing economic importance of collecting, storing, processing and distributing information in the global economic environment.

Employees must be practice-oriented and young specialists must have such feature as competitiveness in order to meet current requirements of the labor market. Education becomes dependent on constantly varying practice.

The classic triad of “knowledge – abilities – skills” ceases to correspond the recent requirements.

The priorities of employers to directed in favor of focused specialist, practically trained and rapidly adaptable to professional activity, having the ability to think creatively. In this context, the quality of training of highly qualified specialists and their further employment becomes actual. Changes have place in the strategy of universities within providing professional competences for graduates, corresponding to labor market requirements.

Today’s definition of “Qualification” involves not only professional knowledge and skills, but also personal characteristics, which are demanded by the certain kind of professional activity. The implementation of such education is possible only with **the introduction of activity and personality-oriented concept in practice.**

Employers have noted that the training quality of graduates of the modern universities in the labor market is determined not only by the excellent grades, and willingness quickly adapt at the workplace and meet the requirements of obtained

profession. Graduates become interested in competency, which can be considered as a kind of sum of skills, including qualification and sociobehavioral characteristics.

The graduates have to be able not just work professionally – they must quickly perceive and interpret the new tasks, make their own decisions and implement them, be communicative, responsible and creative.

Training of these abilities and their development has become one of the functions of educational institutions and organizational structures of the labor market. Each higher education graduate must be in demand at the labor market. This requires precise system of professional education in accordance with the needs of modern society, giving skills of adapt to the constantly changing conditions in the labor market.

It should be developed **a system for demand forecasting of qualified staff** in economy branches and at the national level. Figures 1.5 and 1.6 illustrate the key problems, which prevent the interaction of the labor market and universities.

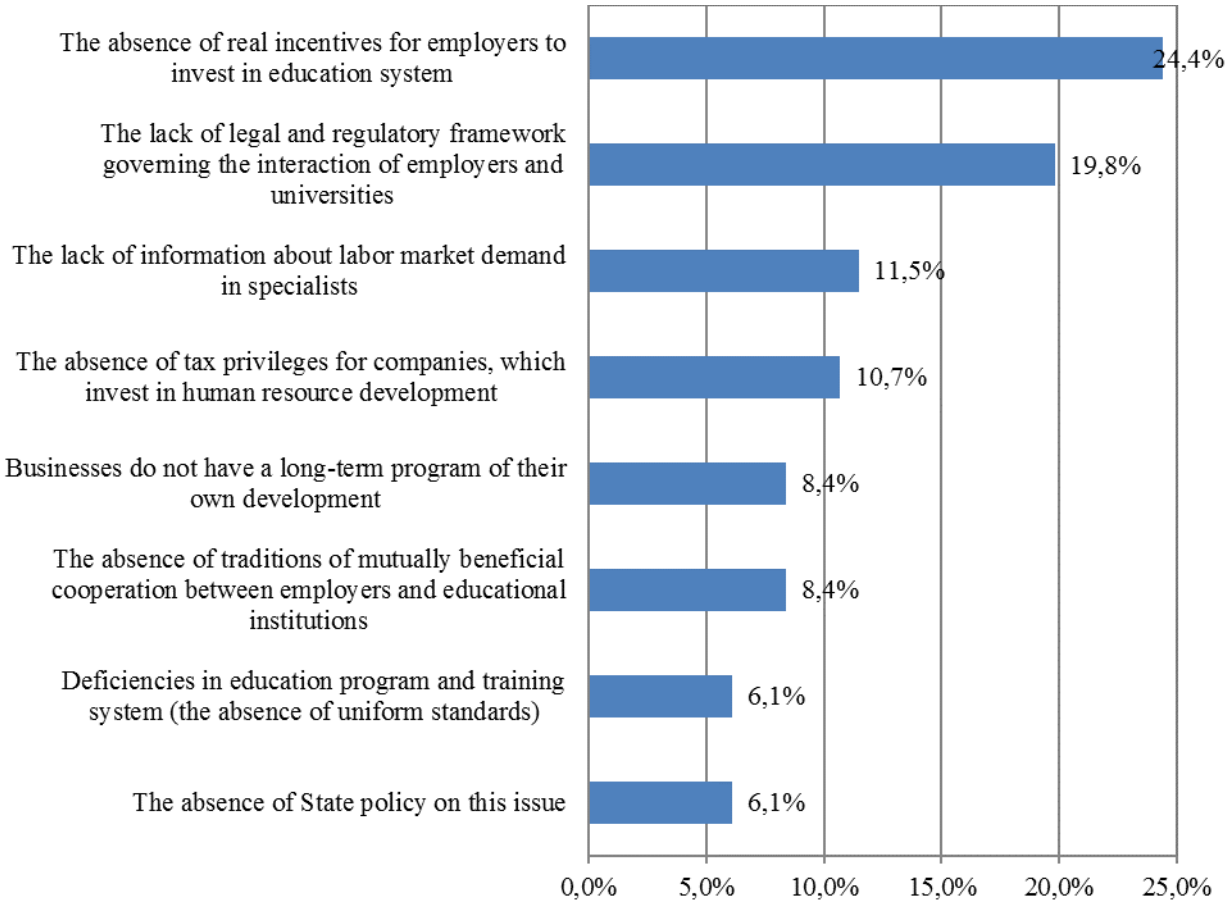

Fig. 1.5. The assessment by educational establishments of the key obstacles to cooperation by employers and universities

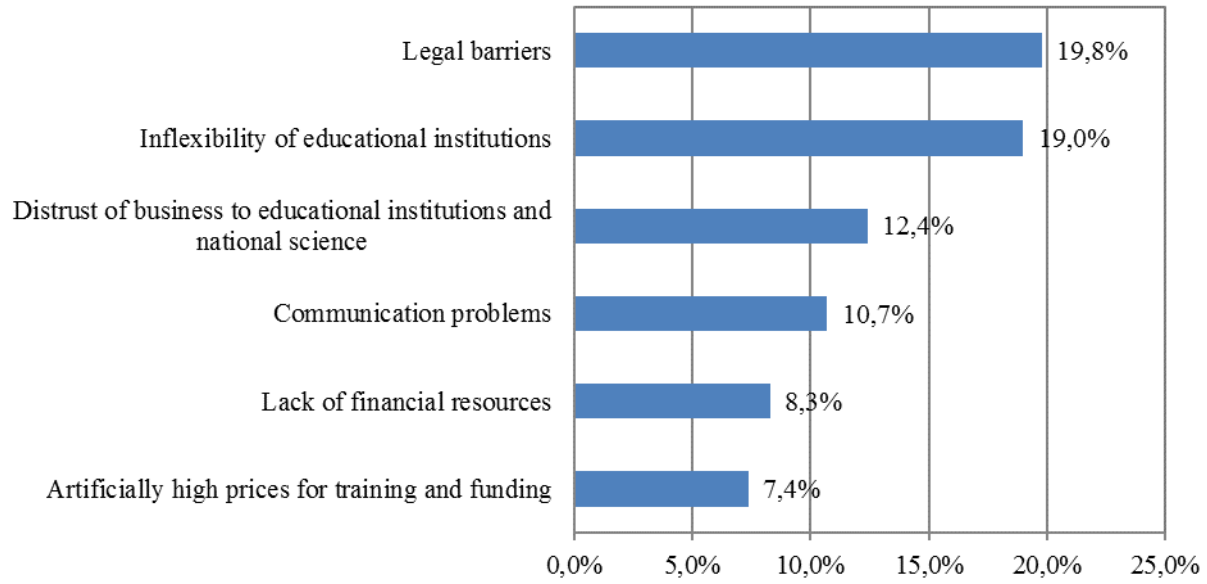

Fig. 1.6. The assessment by employers of the key problems of cooperation by labor market and universities

Competency level of present graduates predominantly does not correspond to modern requirements of the labor market.

Employers have pointed out to numerous defects at theoretical and practical training level of university graduates, and have noted their unwillingness to work by obtained speciality right after graduation.

On the other hand, those graduates, who possess high theoretical knowledge and strong practical skills, often cannot get a job by their profession due to the fact, that high technology and innovative sector of the economy is extremely narrow.

Today, there is the awareness that the quality and competitiveness of higher education and upgrading efficiency greatly depends from constructive partnership between educational system and employers.The need for cooperation is an especially important task in the light of innovation-based development of the economy, its restructurisation and reorientation of the vector of development from raw and resource-oriented to science-based and high-tech.

In the opinion of employers, the training outcome obtained in higher educational establishment should be not only the acquisition by graduates of certain set of theoretical knowledge, but their preparation for successful entry into the labor market, for which such knowledge must be combined with practical experience, behavior skills at the professional environment and corresponding to rules of behavior.

Employers should not be only customers, which forming certain requests, but also active participants of the processes of education sector development.

It is evident from Figures 1.5 and 1.6 that the notion of employers about graduates currently differs from point of view of universities. There is a serious gap between labor market needs and the quality of training in practice. There are different reasons for this gap, but first of all, it is caused by lack of proper cooperation between employers and higher education system.

There are next forms of cooperation higher education institutions with employers:

– Work placements, practical training at the enterprises;

– The partnership of employers representatives in the theoretical training programs;

– Sectorial specific demand;

– Business participation in the financing of the educational institutions, including the updating of material and technical base;

– Employers participating in the supervisory board and coordinating councils of educational institutions;

– The establishment of cooperative innovative training centers (including based on creation of cooperative laboratories with remote access technologies);

– Employers participation in the educational programaccreditation;

– Employers engagement in the graduate selection process (participation in graduation councils, examination boards, career fairs, career days);

– Employers involvement in teacher retraining process;

– The involvement of universities in retraining process of employees of enterprises.

The representatives of higher education institutions offer businesses participate more actively in the learning process – in curriculum development, lecturing by leading specialists, advising in the courseworks and graduation works.

Today, the system of higher education must provide to graduates not only professional knowledge and skills, but also the ability to the communication,the teamwork, solving conflicts, continuous renewal and updating of knowledge.

The competitiveness of engineering graduates in the labor market ensures due to the successful introduction of innovative technologies of training, the combination of theory and practice, the increaseof the mobility of teachers and students of the program.

During the training program, three groups of skills should be formed: technological, communicative and conceptual.

Technological skills are related to assimilation and development of professional skills. Communicative skills are directly relevant to human communication, directed at conflict-free interaction within the group. Conceptual skills are considered as the art of forecasting of events, activity planning, taking the responsible decisions based on system analysis. Eventually these qualities will ensure the demand and competitiveness of graduates in the labor market.

Thus, the optimal combination of professionalism and socio-psychological qualities can ensure high competitiveness in the labor market for the future specialist and the competitivenessin the market of educational services for higher educational institutions.

1.3 The demand for graduates in the labor market as the criterion of quality evaluation of education and professional training

Ensuring of quality education requires institutional modernization of the educational system based on effective interaction between educational establishments and labor market.

Current educational system is characterized by lack of development of adequately independent forms and mechanisms of participation of citizens, employers, professional associations in making decisions connected with educational policy, including processes of independent public evaluation of education quality.

One of the major tasks of education system modernization is the development of quality evaluation techniques and relevance of educational services with consumers collaboration, participation in international comparative researches through the creation of clear, open public informing system about educational service market, which provides completeness, availability, timely updating and accuracy of presented information; mechanisms of active participation of consumers and public institutions in the process of control and evaluation of education quality.

The model of independent quality evaluation system of higher professional education based on the analysis of labor market demand for graduates contemplates quality evaluation of higher professional education according to the results of educational activity (Fig. 1.7).

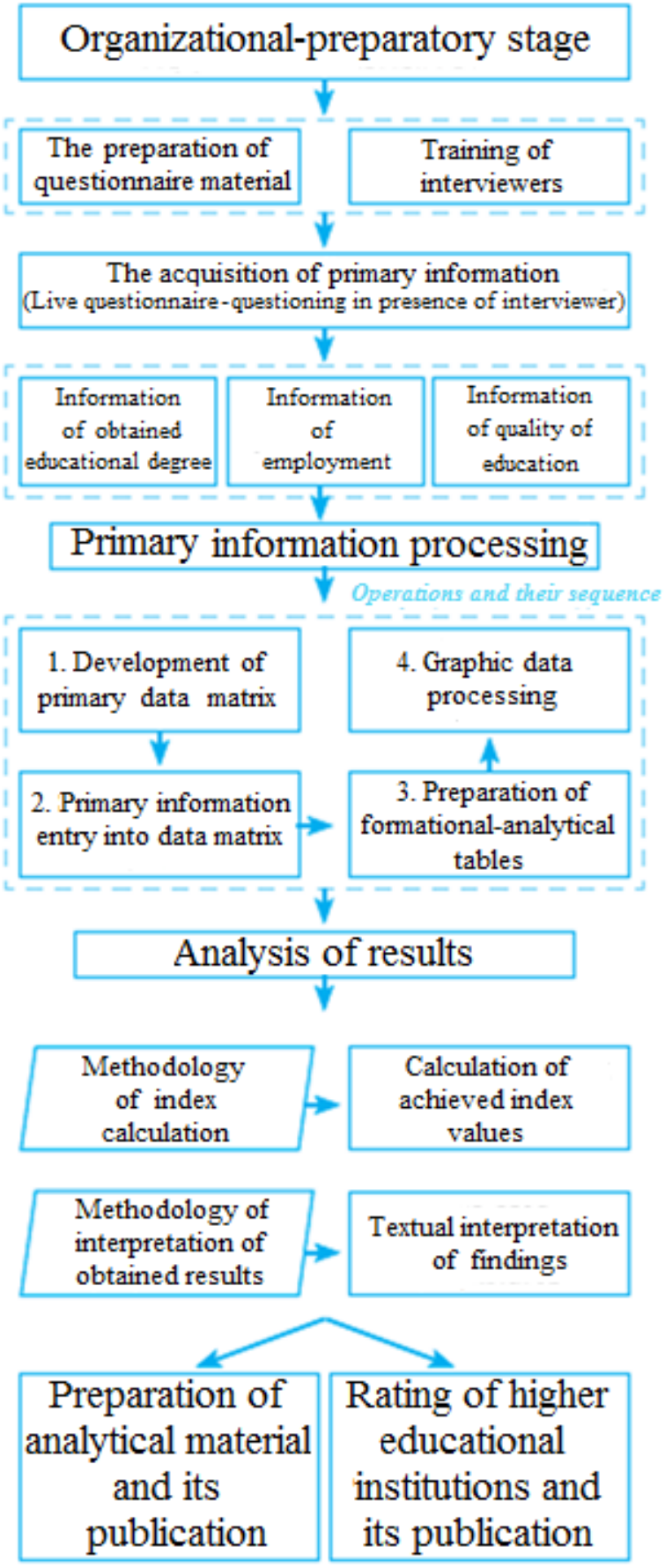

Fig. 1.7. The model of independent evaluation of higher education quality

Thereby, the development and implementation of effective mechanisms of quality evaluation of higher professional education at all levels of educational system is relevant objective.

As such results are used indexes of demand of graduates in the labor market and their career success. The model is based on research of employment process of graduates and identification of factors that determine its effectiveness.

Quality evaluation of higher professional education assumes implementation of following stages:

1. Organizational-preparatory stage;
2. The acquisition of primary information;
3. Primary information processing;
4. Analysis of results;
5. Preparation of analytical material and rating of higher educational establishments, their further publication.

Organizational-preparatory stage includes the preparation of questionnaire material and training of interviewers during.

The implementation of this model involves the application of live questionnaire method. This approach allows increasing the accuracy of received information by means of questioning of all university graduates.

The acquisition of primary information by means of live questioning involves filling up the impersonal questionnaire by all graduates, that includes following question pools:

– Information of obtained educational degree;
– Information of employment;
– Information of quality of obtained education.

Primary information processing consists of four consecutive processes, which are mentioned below:

1. Development of primary data matrix;
2. Primary information entry into data matrix;
3. Preparation of formational-analytical tables;
4. Graphic data processing.

As processing of such large data amount requires the application of electronic automation equipment, then during primary information processing the results of questioning must be "interpreted" into electronic form – data matrix.

This matrix can not be completely standardized, because different higher educational establishments train specialists within different fields of specialties and have different structure of educational departments. In this connection, primary data matrix must be developed for each university separately.

Primary information entry into data matrix can be carried out by interviewers by means of special software or by graduates independently through specialized electronic forms (questionnaires).

Preparation of formational-analytical tables precedes graphic data processing. The structure and content of formational-analytical tables is determined by following:

– university structure of professional training, including a set of specialties;

– the scheme of primary information processing.

Graphic processing is necessary for subsequent analysis of evaluation results; it involves their visualization in the form of graphs, charts and histograms.

The simplification of primary information processing is possible by the development of specialized data processing software.

The analysis of results includes the calculation of achieved index values, textual interpretation of findings and is carried out on the basis of methodologies of index calculation and interpretation of obtained results.

Achieved index values are included in the scorecard, which contains names and units of measurement of indexes, achieved index values, list of factors that have key influence on index value.

Textual interpretation of findings has the form of a report, which contains the impact analysis of organizational conditions of educational process on the demand for graduates in the labor market. These conditions may include:

I. Educational process organization – actions aimed at increasing the demand for graduates in the labor market:

– practical training and internships (required actions provided for educational program);

– advantageous conditions for combining work and learning, and also providing of their efficiency (class attendance schedules, informing about vacancies on terms of part-time employment and others);

– internal quality control system of obtaining knowledge within educational subjects by students, provided by the curriculum.

II. Vocational-oriented education of higher educational institution – program of actions, which are directed to formation and development of patriotic attitude towards

their chosen profession, the ability to analyze the situation and main trends of labor market development, skills of independent job search. Such events may be implemented in the form of elective courses "Introduction to specialty", additional professional training programs, carrying out conferences and round-table meeting on employment and etc.

III. The organization interaction between universities and employers – a complex of special events organized by the university in cooperation with the interested employers for improving the level of demand of university graduates in the labor market. Such actions can be provided by:

– special-purpose training on contract terms;

– the employment of graduates by employers' requests;

– information communication events for recruitment (fairs of vacancies, company presentations, etc.).

Employment efficiency of graduates is characterized by following parameters:

1. The level of demand for graduates (GDL), which is defined by the part of the total number of graduates, which have a work place and (or) work experience at the moment of graduation from university.

2. Professional demand level (PDL), which is determined by the part of the total number of employed graduates, which have jobs in their field of study and (or) related specialties, obtained in university, at the moment of graduation from university.

3. Salary level (SL), which is dictated by the average salary of employed graduates at the moment of graduation from university.

4. The level of professional self-identification (PSIL) is defined by the part of total number of graduates, which plan to get a job in their field of study and (or) related specialties, obtained in university, in the medium term.

5. Expected income level (EIL), which is determined by the average salary of employed graduates at the moment of graduation from university, which value, proposed by the employer, can become the reason for job change.

6. Expected income level of jobseekers (EILJ), by which is meant the average salary of graduates, not employed at the moment of graduation, proposed by the employer, which can be the reason for employment.

7. The level of career support (CSL), which is defined by the part of the total number of employed graduates, which have jobs at the moment of graduation from university, which have found a job by means of following ways:

– informing through university media (website, advertisements, etc.);

– as a result of graduation of special-purpose training on contract terms;

– during traineeships (educational, industrial, predegree practice);

– as a consequence of participation in fairs of vacancies, career days, carried out by higher educational institutions;

– by application to university employment center;

– upon the teacher's recommendation.

CSL shows the degree of university participation in building of successful career of its graduates and, more precisely, the quality of cooperation between universities and relevant employers, including the quality of purposeful work of employment promotion.

8. Career support efficiency (CSE), which is determined by the average salary of employed graduates at the moment of graduation from university, which have found a job by means of following ways:

– informing through university media (website, advertisements, etc.);

– as a result of graduation of special-purpose training on contract terms;

– during traineeships (educational, industrial, predegree practice);

– as a consequence of participation in fairs of vacancies, career days, carried out by higher educational institutions;

– by application to university employment center;

– upon the teacher's recommendation.

9. The correlation of professional requirements (CPR), which means the character of dependence of the demand for graduates from the progress during the training period.

CPR allows to evaluate the correspondence of requirements of the university to training of its graduates to the requirements of employers to professional training of their employees.

The factors, influencing to the efficiency of graduate employment, within the framework of researches are following:

– the experience of graduates obtained by them during the training period;

– the salary of graduates;

– progress of graduates during the training period;

– ways of the employment (getting information about vacancies), used by graduates in the employment process.

IV. The use of results of quality evaluation of the education, based on the analysis of the demand for graduates in the labor market.

The results of this evaluation can be presented in the form of analytical report or ranking of universities. The results of quality evaluation of higher education, obtained by means of proposed model, allow:

1. For citizens – consumers (potential customers) of educational services – to make substantiated choice of the entrance to certain higher educational institution, the selection of educational degree (bachelor, specialist, master) and educational program, based on employment indexes for graduates of higher education institution, the specialty, the faculty, etc.

2. For employers – to plan the interaction with higher education institutions, based on the comprehension of actually achievable results of the demand for graduates of certain higher educational institution in the labor market; to identify potential areas of investment into educational process, including in the form of special-purpose training on contract terms.

3. For state executive authorities, for educational authorities, for founders of higher education institutions – to make managerial decisions oriented to:

– the optimization of the network of educational institutions of higher education in accordance with educational activity results;

– the adjustment of planned admission number of students on the first course of study, based on the results of the demand for graduates in the labor market;

– making of managerial decisions;

– upgrading of educational content in a number of higher professional education programs;

– development and implementation of employment programs, based on data of the employment indexes of young specialists.

4. For rectors of higher educational institutions – to use developed system in order to provide intra-university monitoring of actual quality of training of bachelors, specialists and masters, including the evaluation of activities of structural departments for building constructive relationship with relevant employers.

Eventually, the system of independent quality evaluation of higher professional education, based on the demand for graduates in the labor market, is capable to satisfy the interests of all consumers of educational services in terms of providing reliable and objective information about higher education quality in each institution of higher education.

The quality criteria define the characteristics of well designed and pegogically adequate learning materials. The criteria include four fields in evaluation: use, contents, production and utility. The evaluation tool can also be helpful at the design stage to support and guide the development of learning materials.

The criteria aim to ensure the communicative clarity, technical function and good accessibility of learning materials. High-standard materials must fill also the legislative requirements. The security of learning materials is also a integral part of the quality criteria.

In addition, the implementation of this system is relevant for higher education institutions as it permits intra-university monitoring of actual quality of education system with consequently increasing of the potential of the internal evaluation (self-evaluation).

Chapter 2

LEADERSHIP AND ENTREPRENEURSHIP IN THE CONTEXT OF HUMAN CAPITAL

2.1 Activization business activities through the development of competence-based approach

The disconnect between practice and theory in HRM can be traced to several factors. Such as, lack of "systems thinking" in curriculum in most Universities departments, the dominance of linear approach in most HRM models, and lack of scholarly articulating the implications of systems thinking in HRM practice.

There is, therefore, the need to re-conceptualize HRM in the context of the rise in complexity theories and fully acknowledge that there is a parallel outlook of implementation of systems theory and thinking (ST&T).

In the field of human resource development (HRD) systems theory and thinking (ST&T) is a crucial component of the research and practice in HRM Ardichvili, Hartshorn, Iles, Yolles, Lee, McLagan, Swanson.

Gene L. Roth was acknowledged that systems theory has been proposed as a logical starting point for examining HRD. Roth (2004), however, contended that like the field of HRD, lack of consensus regarding the boundaries of ST&T might also influence how HRD professionals may use ST&T in research and practice.

For example, HRM has several systems such as analysis, diagnosis, intervention development, implementation, and evaluation (ADDIE); learning models; action research; planned change; field theory; performance improvement; and learning organization models, for addressing individual and organization change, but has little to show on how the discipline addresses the intricacies of power, politics, and culture in organizations.

Consequently, the qualitative profile of the specialist skills must be related to the expectations of the labour market and be the basis of the professionalization of training. The search for answers to this challenge has shown the existing European approach. To adjust the curriculum it is necessary to create a permanent mechanism for monitoring and evaluation of innovative elements of the educational process.

The willingness and ability of universities to develop and maintain a continuous

improvement process will depend on the success of graduates in the labour market and, as a consequence, of competitive business.

One of the priority fields of innovative development of Eastern European countries is activization of business activity of population. It is supposed to form the economical pattern of thoughts of students of different specialties paying attention to students who study in Business and Entrepreneurship. Data analysis of the labour market shows that young specialists in Engineering and Computer science are more demanded, less – in Economics. Young specialists of Commerce on the labour market have a level 4.3 points according to 10 point scale.

Specialist study is supposed to acquiring knowledge and skills within the chosen speciality, which are demanded by the labour market. The program of the 1st cycle according to the Lisbon Recognition Convention (1997) has to provide the access to the programs of the 2nd cycle. In accordance with Dublin descriptors of qualifications (March, 2002) it is planned to develop the work skills during the first cycle of study which are necessary for further study that has a higher level of independence as bachelor study is oriented to the further study.

One of the main tasks of the Bologna process is the development of European cooperation in order to elaborate criteria of quality including educational programs. In Eastern European countries, Quality assurance system includes conditions required for achievement of necessary results, control of the quality of the learning process and its results. Students are not involved in the system, and as a rule, involvement of international experts are not used.

Conceptual bases concerning the realization of the competence approach in training specialists using two and three level of education are in the provisions of Sorbonne Declaration and Bologna Declaration, Lisbon Agreement, the St. Petersburg summit “Group of Eight” – “Education for innovative societies in 21st century”, National Doctrine of higher education development in Ukraine in 21st century.

Nowadays in Eastern European countries professionalization of higher education requires internationalization programs to provide and develop new tasks of the labour market as well as to ensure entrepreneurial activity of the population.

Practice as used in this study encompasses scholarly practice (research and teaching) and practice in terms of working with organizations. However, the apparent lack of applications of systems thinking by HRD practitioners, professionals,

researchers, and students raises the question why a theory generally accepted as a foundational theory is not seen in practice and in learning, as it should.

In order to implement effective HR, managers need to know other features of their employees too. Data received from the analysis of employees competencies can define as employee weaknesses that may affect the performance of assigned responsibilities so his strong characteristics that are not used in the process of work. In addition, during the competence quality control, employee's potential can be assessed in order to enable them to personnel reserve.

The literature review led to the following conclusions. Prahalad and Hamel's introduction of core competencies can be seen as further contributing to the mainstream popularity of competency-based thinking as well as usefully of organizational strategy within competency models. In contrast to the form of competencies discussed thus far, core competencies exist at the organizational level of analysis and are characteristics that allow an organization to rapidly adapt and innovate. As Schippmann et al. suggest the increased focus on organizational competencies and the increasing speed of changes in the world of business, likely encouraged a parallel increase in interest for individual competencies that could support the development of an organization's strategy and core competencies.

Noting the recent trends in the global economy it is possible to point out the impact of scientific and technological progress, innovation vector of development, the accelerated motion of the productive forces in the international labor market, the spread of knowledge and the formation of the international education market, increase efforts to monitor international initiatives, labor migration resources. Consequently, there is an interchange of "material" and "intellectual" factors of production.

Thus, assembling of electronic circuits today the primary materials are 2% of the costs and 98% go for skilled labor.

Sustainable progressive social-economic development of the country, its leadership position in the external market is ensured by the developed "knowledge generation" environment. The latter is based on the significant sector of fundamental research, availability of effective educational system, developed innovation system as well as state policy directed to the innovation stimulation.

The changes taken place in the sphere of labour and employment, necessity to solve economic problems having the aim to make enterprises competitive and efficient, rapid and adequate response to the changes associated with the development

of the new technologies require respective organization of engineering work and, therefore, special attention to higher technical education.

To activate the innovations in the European Union, the potential of innovations should be purposefully developed and effectively used. This is not only a major condition of successful development of the economy in the European Union, but also a major factor influencing the solution of the significant global problems of economic development and technological advance.

The importance of the innovation potential in the European Union for economic development and technological advance in the world is determined by the current role of the European Union and its influence on global changes.

The European Union has quite a few ways of using human, financial, material and other resources effectively and purposefully. It coordinates the implementation of innovative projects and aims of producing long-term qualitative changes. EU can be state that a great potential of political decisions and organizational and administrative skills are necessary for achieving synergistic effects.

Results of globalization include the integration of research, the growth of scientific communication and accelerated development of the international labor market. In turn economic development accompanied by increased demand for labor.

The labor market is an integral part of the overall economic and market mechanism. It is characterized as one of the most difficult social and economic phenomena of society, which reflected all sides of his life. It shows the whole diversity of interests and contradictions.

Employment in the general population and especially young people has not only economic but also social meaning as a form of adaptation of different social groups to the market.

Adjusting the demand for labor requires analysis of factors that affect it. Increased demand can be achieved by stimulating it through the creation of new permanent or temporary jobs, the development of non-standard forms of employment, direct investment in the creation and renovation jobs.

In order to start the development of measures to improve the competence of technical specialists of the enterprise one must firstly determine what competencies should have priority.

Human resources potential of an enterprise in a Kharkiv region are presented in Figure 2.1.

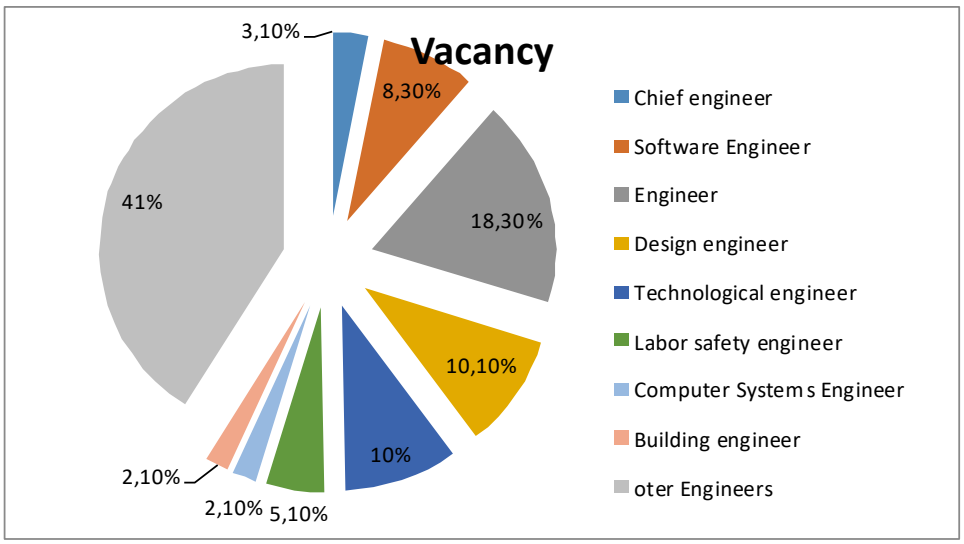

Fig. 2.1. Human resources potential of an enterprise in a Kharkiv region (engineering component)

A questionnaire among 117 undergraduate of engineering majors was done. Results of the importance of general competencies determination are listed in Figure 2.2.

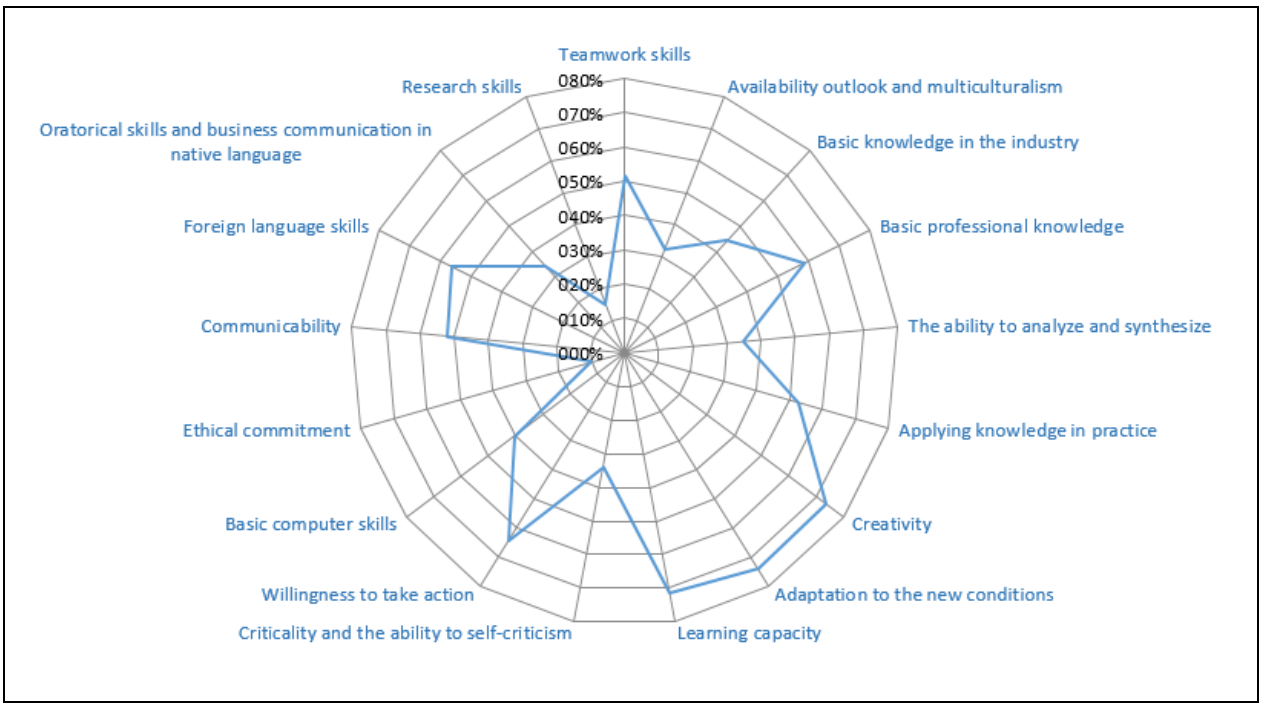

Fig. 2.2. Assessment of the Needs in the social, personal, systems and instrumental competencies

So, we can see from the survey that the most important are the following competencies: ethical commitment, research skills, outlook and multiculturalism.

In practice, some companies use only the core competencies, while others develop and use management, and some of them develop a special competence for the job groups of different departments.

In thus way, classification divides competences on the following groups:

1) simple, with a single list of indicators of behavior (standards of knowledge and skills that are observed in the actions of a person of a particular competence;

2) detailed ,consists of several levels, the amount of which is determined by the objectives of the competence model of;

3) threshold competences include knowledge and behaviors that are required for admission to the performance;

4) differential ones contain knowledge and behaviors that distinguish the best staff from the average workers (poor workmen).

The principle of designing an employee reference model has been used during training of qualified specialists. This principle demands a combination of qualitative and quantitative methods of the sociological analysis. The qualitative methods include personal interviews; work with focus groups and mini groups. The quantitative method is carried out in the form of a survey representing information gathered from respondents via questionnaires.

The requirements for the educational standards of higher technical education should be formed by market demand of specialists with a clear list of competencies. Having compared the list of necessary competencies for a specialist in a particular subject area (specialist model) with the list of planned competences of a graduate student in his/her major within the same subject area (graduate model), the partner universities will be able to train specialists who will meet the labour market requirements.

For satisfying the needs of the developing knowledge-based economy is important, that international cooperation would be based on the networks of universities, research institutes, parks of science and technologies, innovation centres, clusters of technologically-oriented organizations.

In order to successfully meet the challenges of a dynamic environment, it is necessary, along with other active skills to develop the students' such skills as independent decision-making, the ability to take risks, development of personal capabilities, internal control, confidence, entrepreneurial skills of the individual. This

is due to the need to find innovative ideas and the development of creative and entrepreneurial skills in the current economic situation. Personal-business performance effectively develop throughout life, if they are passed in the learning process interactive/practical way.

At the same time, skills can never be complete because of the complexity of social relations. Social competence suggests an answer to several questions, namely:

- What is distinguished me from others?
- What are my weaknesses and preferences?
- What in me may irritate the other people?

Search for answers to these and other questions helps teamwork, execution of projects tasks, the results of which will be based on successful communication.

We need to develop along with the professional competence also social skills. It should be noted that both directions are amplified and successfully developed with internationalization.

The development of international programs is most effective when focused on students and their faculties. An important component of this type of cooperation is to find areas of common interest as the basis for the establishment of joint programs in various disciplines.

Thus, the development of new forms of education makes it possible to improve the quality of education, support and promote cooperation in education, to form an internal education policy, cultural policy, migration and visa policy, trade policy, economic policy.

The formation of the knowledge-based economy requires a change in all the areas of social, economic, political and scientific life of Ukraine. At the same time, creating the knowledge-based society affects the content of the processes of globalization and the situation in the modern world. This scheme combines economy and education and allows students to choose educational trajectory.

Important recommendation is critically review the curriculum engineering to determine the level of ST&T; and how it can reality contribute to research, teaching, and practice of HRD. The social robustness of curriculum will determine the value of knowledge. In addition, how ST&T in HRD can be of practical value. This is the way to place HRD in the forefront of producing 21st-century professionals in leading adaptive change.

The positive experience, which is accumulated during implementation of the TEMPUS project ««ICo-op»: Industrial Cooperation and Creative Engineering

Education based on Remote Engineering and Virtual Instrumentation (530278-TEMPUS-1-2012-1-DE-TEMPUS-JPHES)» will significantly increase learning efficiency and improve the quality of student's professional training program to the level of international labour market standards and requirements.

2.2 Leadership role in organizational changes

Self-insight, conscious personality development and the continuous tracking of the changes in our personality play important roles from a leadership point of view. This section summarizes the findings of a Hungarian coaching-related survey in order to reveal personality differences between leaders and non-leaders.

Our aim is to contribute to the development of coaching practice and education. The survey concerned measures 11 primary and 5 secondary personality factors based on 165 questions. 100 leaders and 200 non-leaders (100 men and 100 women) were asked to answer a questionnaire. Along with graphs and explanations, the results for each factor are listed below; giving the reader an opportunity to compare them.

Good leaders possess accurate self-insight, which they continually strive to deepen. The basis of accurate self-insight is balance. Both overly positive and overly negative self-evaluations can be barriers to the development of successful organizational abilities. Deeper self-insight helps us to have a clear vision of our aims and how to achieve them. Leaders need to form a picture of themselves that contains both advantageous and disadvantageous traits.

Personality can be measured from various points of view, there are lot of personality tests. However, the motivational structure of the personality is rarely examined by scientists. This structure contains those deep, significant, partly genetic primary needs, which determinate our aspirations, instruments, aims and also the style of our socio-strategies. These motivations or needs are more complicated than our instincts and generic-biological programmes. These drives are also referred to as "psychogen needs", because they exist in the human-psychic sphere.

The exploration of these factors has motivated lots of scientific researchers to create various instruments and tests.

By filling in the above-mentioned questionnaire, we can compare ourselves in relation to other leaders concerning factors like: motivation for performance, sociability, aggression, the need for defence, scrupulousness, dominance, exhibitionism, independence, regardfulness, order, and helpfulness; and as secondary

factors: the need for self-justification, rational dominance, aggressive non-conformitivity, and passive dependency.

On the basis of these results, we cannot say that one person is a better leader than another. However, if we know our ordinary and less ordinary features, it helps us to orient ourselves and think over our aims. By the means of this survey, which deepens our self-insight, we can find out where we are at the moment and where we would like to go.

In this survey there are no "abnormal" results. Our needs are not good or bad, they just have different values attached to them. By taking a closer look into the mirror we have made, we can estimate our skills and abilities. Furthermore, we can decide what things we would like to develop and the ways in which we would like to develop them.

The results, with our interpretations, are shown below.

1.1. Motivation for performance.

Motivation for performance (Figure 2.3) is an inner motivation to create something, to win in a competitive situation, to be successful, to show our competences to ourselves and others, and to prove our skills and abilities.

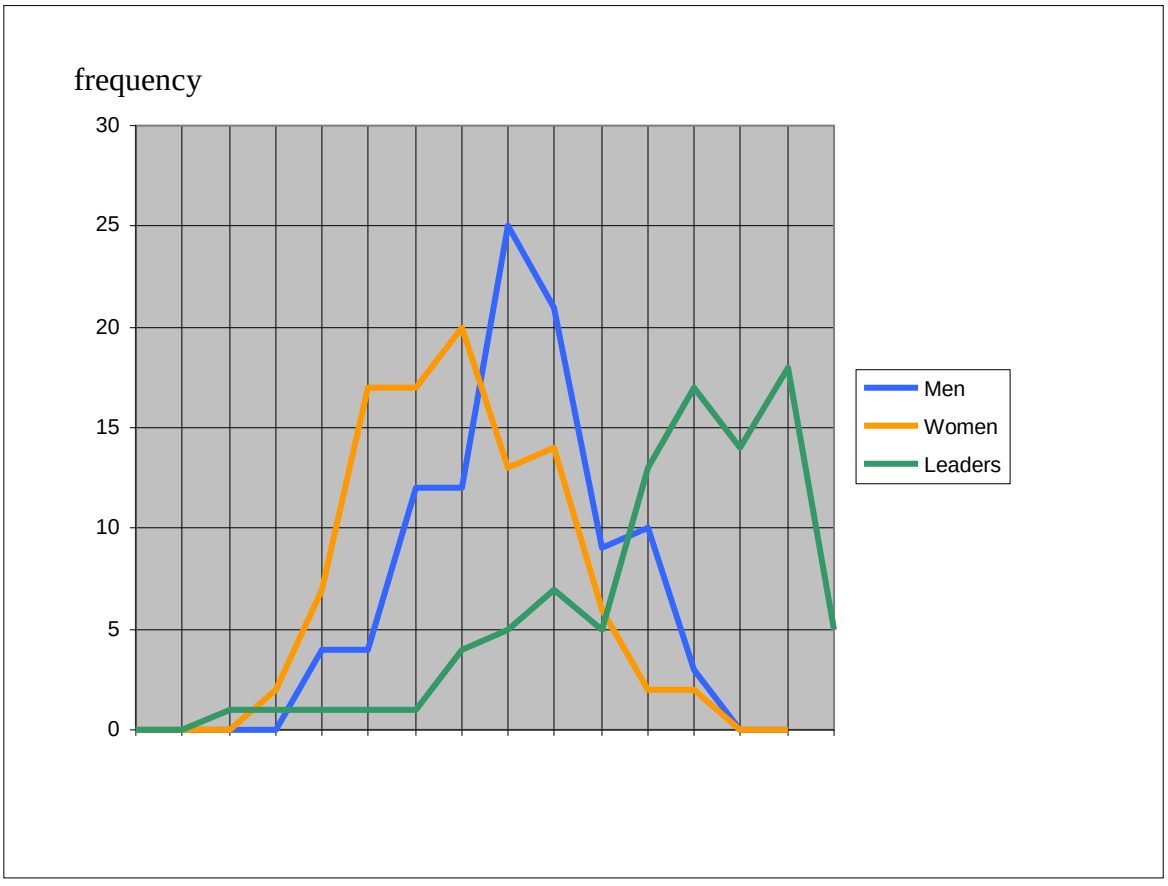

Fig. 2.3. Motivation for performance

90% of the Hungarian leaders have scores between 7 and 14, non-leader men have scores between six and twelve, and non-leader women between five and ten. People over 55 years of age score 1 point less. The Figure demonstrates that leaders' motivation for performance is higher than non-leaders'.

People who have higher scores try to show and prove their abilities in every situation. They value work and productivity (and respect it in others as well). They like challenges, competitions, and adventures.

If a person scores fewer points than average, it indicates that he or she is rather quiet, accomodating, less driven and less work-centric. Most of us have some motivation for performance. We differ only with regards to the amount of this quality we possess. Therefore, people should not be judged on their level of motivation for performance. A person who has a score of one is not any less valuable than somebody with a score of 15.

1.2. The need for affiliation.

The essence of the need for affiliation (Figure 2.4) is the desire to belong somewhere. This includes the need for social membership and the need for human relations with relatives, friends and partners.

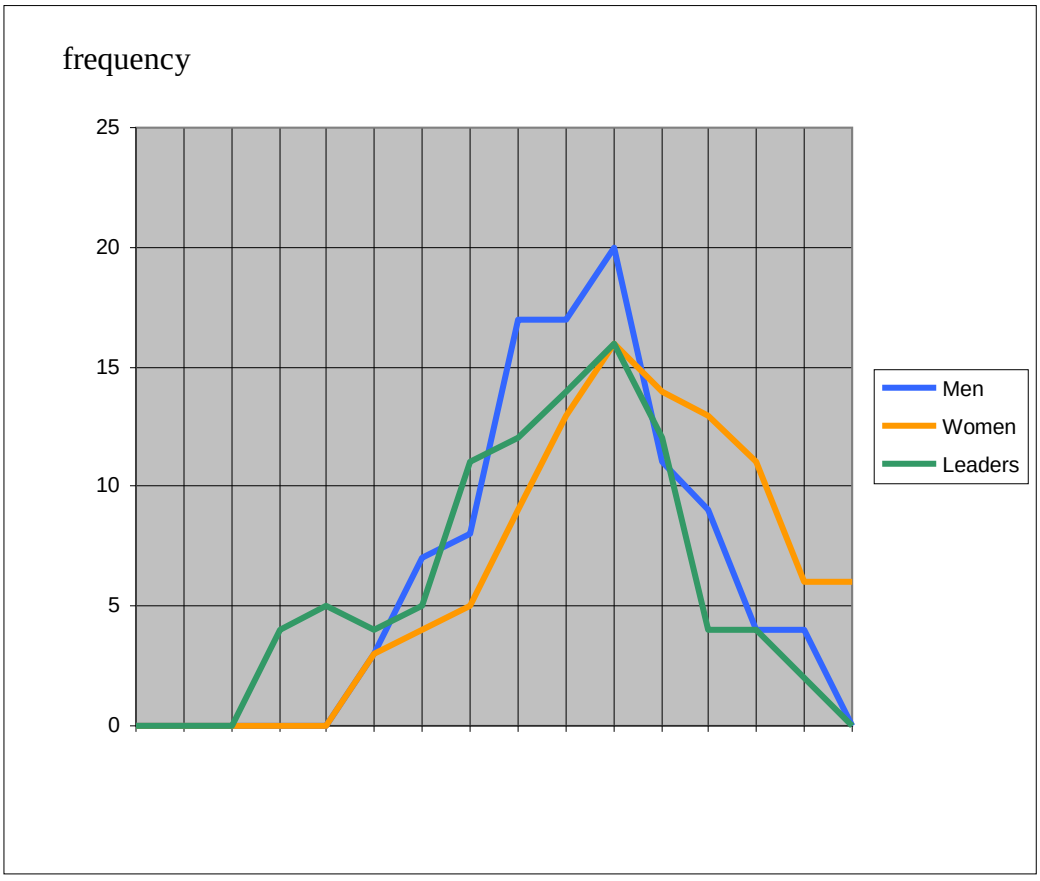

Fig. 2.4. The need for affiliation

This need played an important role in the past, because it was one component in the quest for survival (the lonely individual died quickly).

Everbody has the need for affiliation: 90% of the Hungarian leaders score between 5 and 12 with regards to this factor, non-leader men score between 6 and 12, and non-leader women between 8 and 13. These scores are unrelated to age. These results do not show a significant difference between the leader and non-leader populations.

People who score above the average have more emotional links to other people such as friends and relatives (not necessarily social relationships). These individuals show attention to the people around them.

People who score below the average are likely to be rather unsociable, lacking in empathy, introverted, and possibily egoistic.

1.3. The need for aggression.

Aggression is not necessarily a negative feature. Survival seems to be impossible without aggression (Figure 2.5).

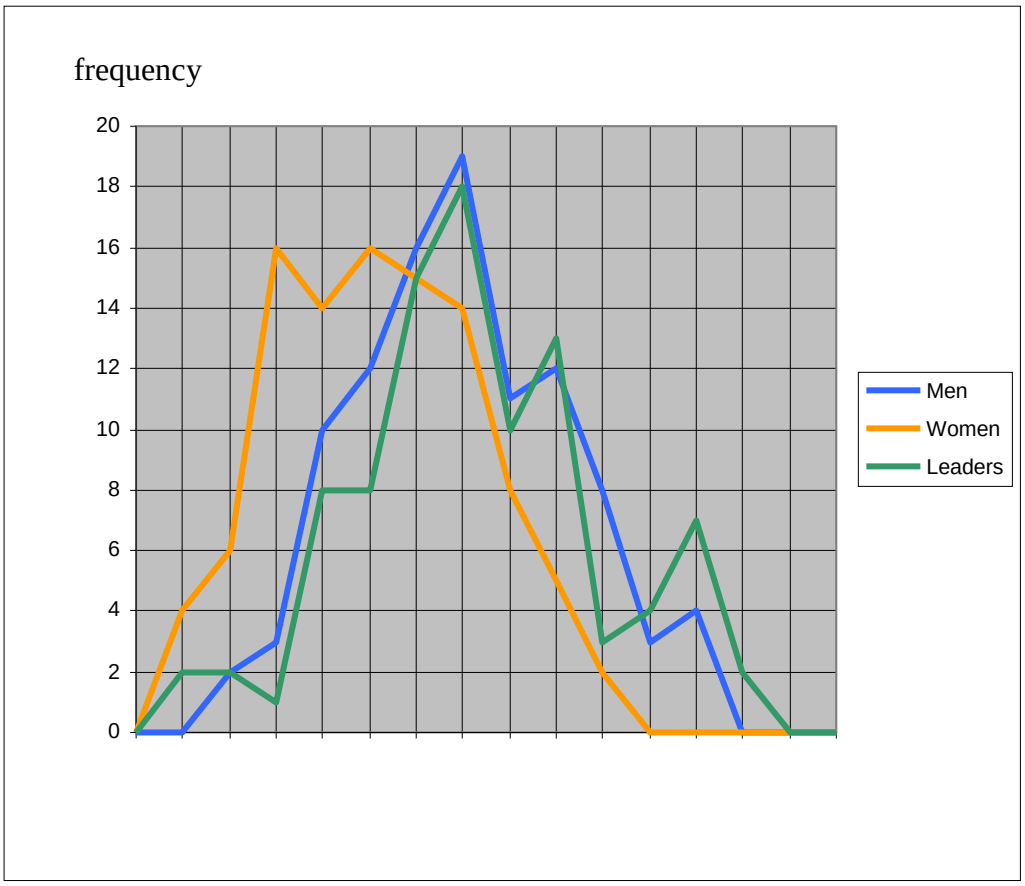

Fig. 2.5. The need for aggression

Leaders scored between 5 and 11, non-leader men scored between 4 and 10, and non-leader women between 3 and 7. The need for aggression decreases with age: for people above 60, scores of only 1 to 2 points are common. The figure shows that the results for leaders are closer to those of non-leader men than non-leader women.

Individuals who score more than ten are often prone to anger and direct wish-expression. (They also frequently have a need for anger management) These people are often surprised at their scores.

Those with low scores are calm, peaceful and gentle people, who would rather submit, surrender, and give up than come into conflict with somebody or fight. There is no doubt that society strongly reduces the need for aggression, but higher scores do not mean a problem. They just indicate a personality feature that one can use as a drive in various areas of life.

1.4. The need for defence.

This motivation means self-defence (Figure 2.6). This can include both physical and psychological defence, but also the defence of our self-esteem and the positive picture we have created of ourselves.

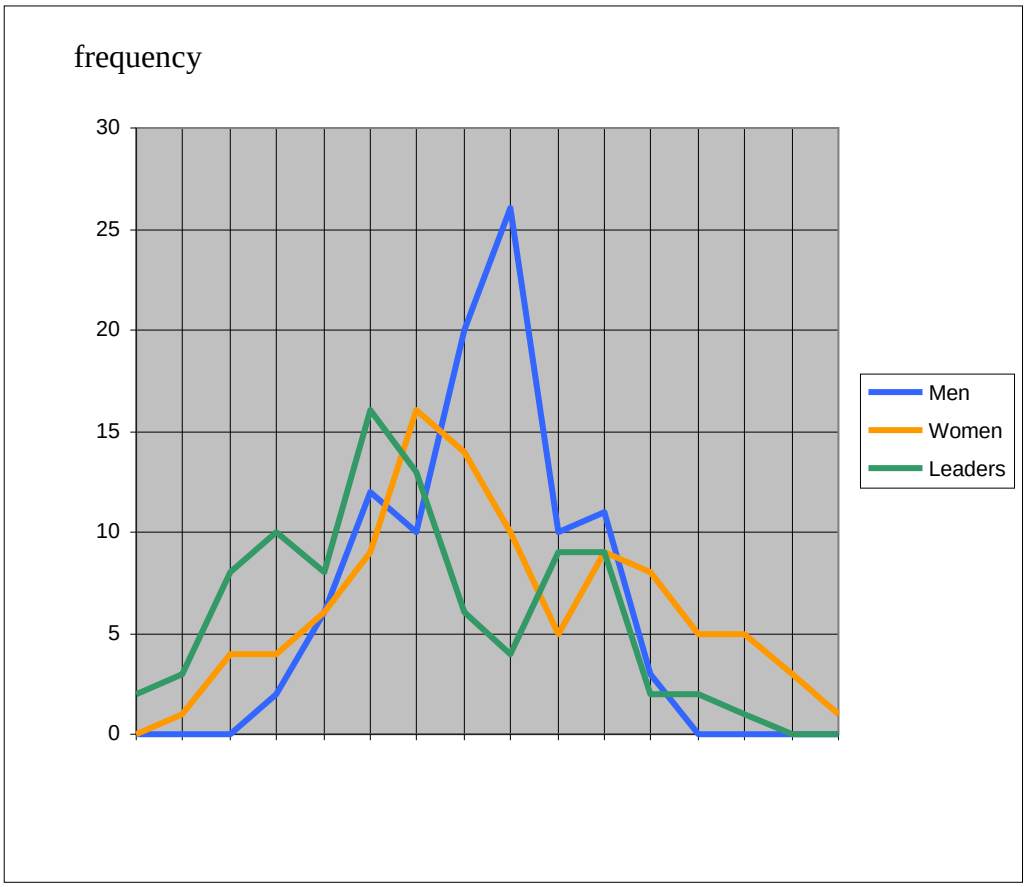

Fig. 2.6. The need for defence

90% of Hungarian leaders got scores of between 2 and 9, and non-leader men scored between 5 and 10, as did non-leader women. These scores change slightly with age. The average scores of leaders and non-leaders are very similar, but the deviation is smaller with non-leader men.

People who score higher than average are basically defensive. It is important to them to avoid failure. They often explain away episodes of bad luck and reject criticism, because they have to defend their precarious self-esteem in this way.

Individuals with lower scores tend to be accommodating, flexible people, who are willing to change. These people can easily bear the consequences of failure. They often have very strong self-confidence, but can be modest as well.

1.5. The need for scrupulousness.

In fact, here we are focusing on the characteristic of remorse (Figure 2.7). We need to believe we act in a moral and decent way. If we know we have not behaved in this manner, we require penance, confession and absolution.

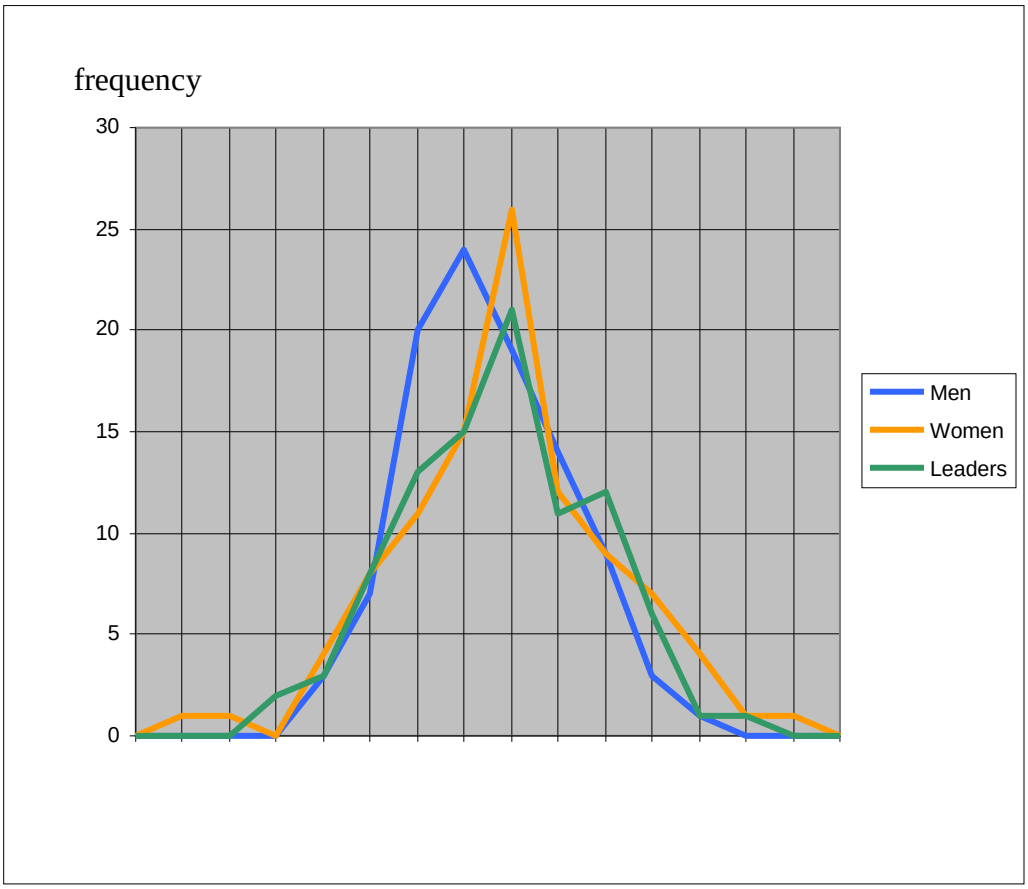

Fig. 2.7. The need for scrupulousness

The leaders' scores are between 5 and 10, and are similar to those of non-leader men and women. Between ages of 55 and 60, the score increases by 1. The three

curves are very similar, so there are no significant differences regarding sex, age, and position.

People who have high scores are usually scrupulous, fair, faithful, well-balanced, loyal and ethical.

Lower scores indicate people who are frivolous and unscrupulous, and who have less of a conscience. Such individuals have a preference for play-acting and they sometimes break the rules.

People with very high scores (above 13) can be self-destructive and masochistic, while those with scores from 0 to 2 may sometimes exhibit irresponsible, inconsiderate and insensitive behaviour.

1.6. The need for dominance.

The need for dominance means the desire to have power over other people and the wish to be in control (Figure 2.8). This need motivates people to become politicians, captains, chairmen and leaders in various fields. This trait is in every of one us, we just differ in the extent to which we possess it.

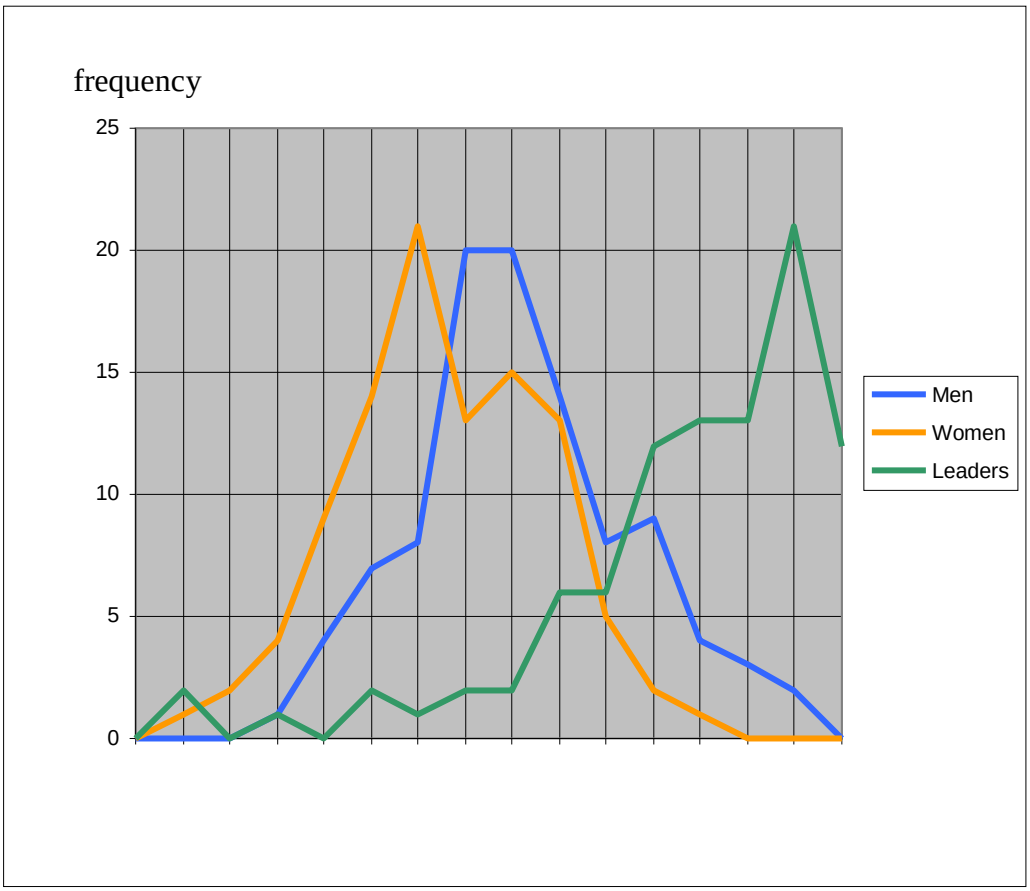

Fig. 2.8. The need for dominance

90% of Hungarian leaders scored between 7 and 14, non-leader men scored between 5 and 11 and non-leader women between 4 and 9. For those above 60, the score is 1 point less. The Figure shows that the leaders' need for dominance is much higher than that of non-leaders'.

If a person has a score above average, he/she will probably strive for a leadership position. They will have a strong motivation for leading and ruling over others.

Low scores naturally mean the opposite: an accomodating, rather receptive person who carries out orders obediently and efficiently; instead of a dominant or leading personality type.

Very high scores indicate people who, besides having good social skills, are often very successful. Naturally, on the other hand, such individuals usually have a lot of conflicts as well.

1.7. The need for exhibition.

This need reflects our concerns with our appearance and our desire to push ourselves into the centre of attention (Figure 2.9). Regarding this need, parallels are often drawn with the good-looking Greek guy *Narcissus*. All of us have this need, even if in some cases we would like to hide it.

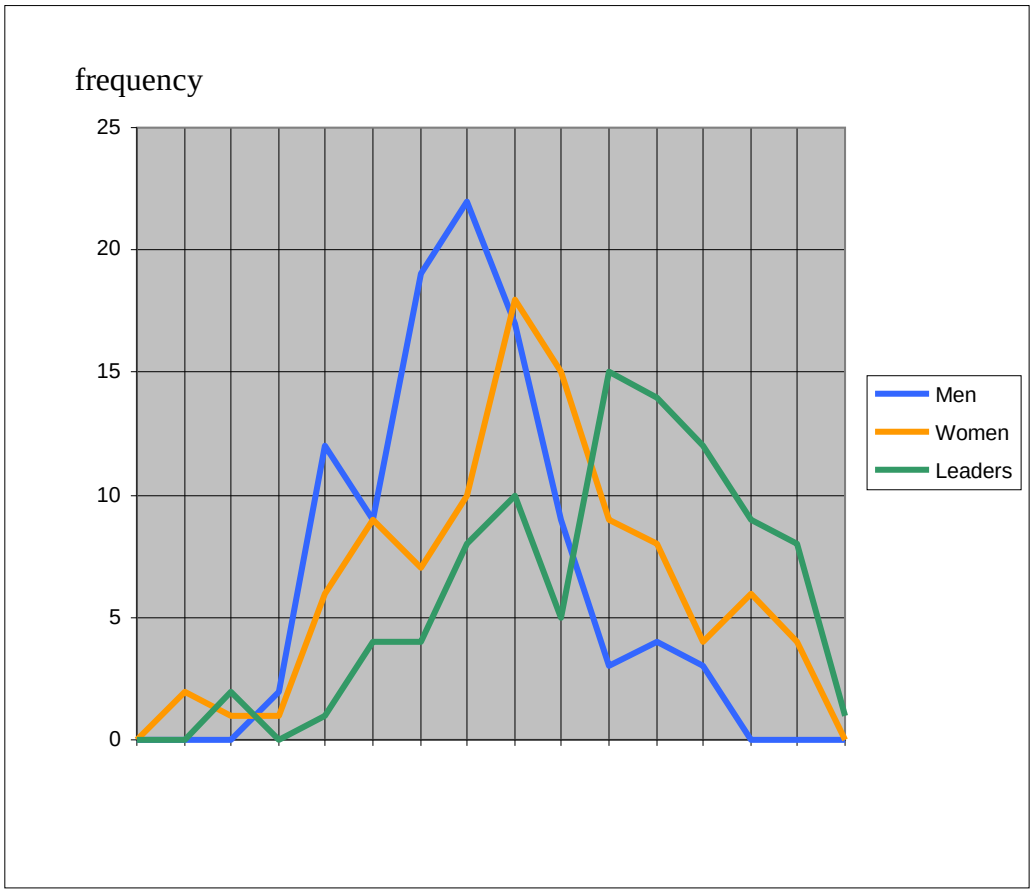

Fig. 2.9. The need for exhibition

Leaders have scores of 6 to 13. The average for non-leader men is between 4 and 9, whilst for non-leader women – at between 5 and 10 – the average is slightly higher. These scores decrease quickly with age: for people above 60, the score is at least 2 points less. Taking all this into consideration, we can conclude that leaders show much more exhibitionism than non-leaders.

Individuals with high scores tend to become actors, politicians, teachers, artists, and even doctors and lawyers. People who work in these professions and who do not have a strong need for exhibitionism worry a lot. The need for exhibition is not only a female feature. Presenting ourselves has been the key to survival since ancient times.

People with lower scores may display characteristics associated with severity, dignity and reserve.

1.8. The need for autonomy

Autonomy can be defined as having independence, and acting according to our own will and inner compass (Figure 2.10).

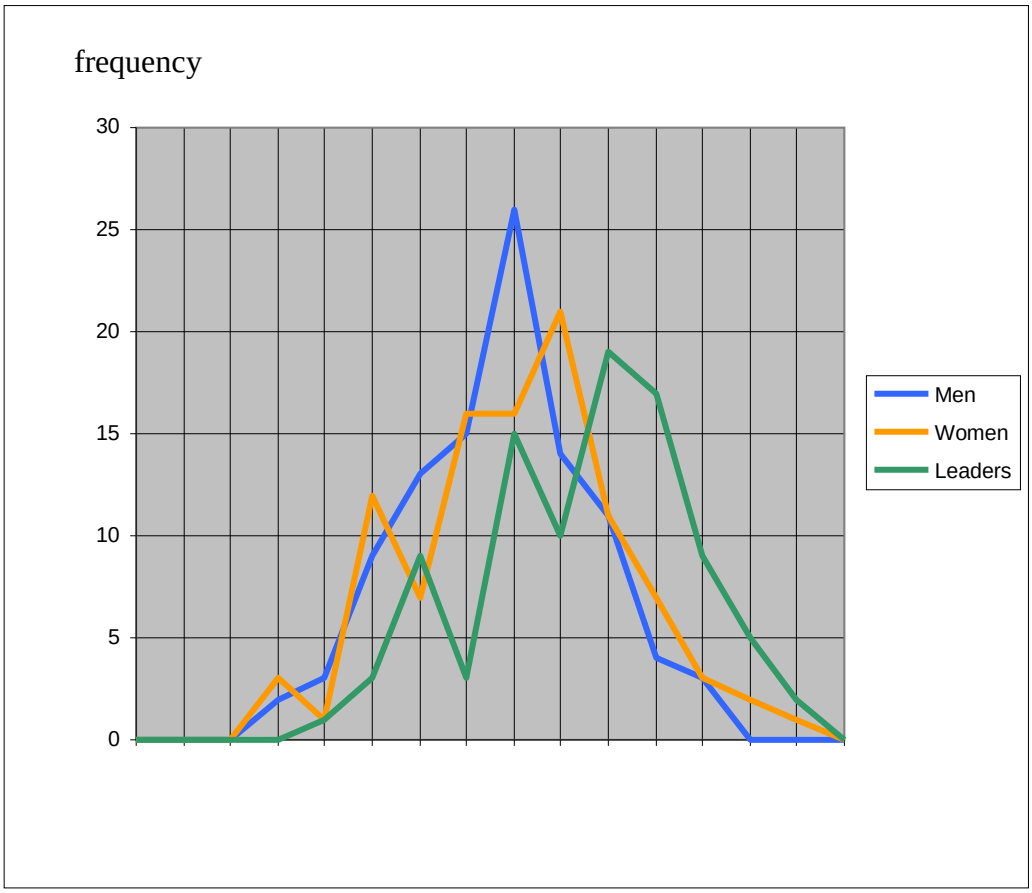

Fig. 2.10. The need for autonomy

90% of Hungarian leaders scored between 7 and 12, non-leader men and women both have scores of between 5 and 10. Leaders have a greater need for autonomy.

People with higher scores particularly require independence from others, act on their own, and make their own decisions about what they like and what they reject. When making decisions and forming viewpoints, they do not follow public opinion or the advice of others. They make their own rules. They stick to these rules even if they cause conflicts or have drawbacks.

People with low scores are good at making adjustments, and tend to display characteristics of dependence and obedience. They like group decisions, tend to believe public opinion, and can easily tolerate being dependent on others. They are good subordinates. People with low scores are easy to deal with, while those with higher scores can be more difficult.

1.9. The need for regardfulness.

One of the most typical forms of regardfulness (Figure 2.11) is so called “the maternal instinct”, which can be defined as defending, feeding and loving the weak. From a broader perspective, this is the inner need to help the unlucky, sick and weak. This intention is a basic need from ancient times, because only those groups whose team members helped each other during times of trouble could survive (other groups quickly perished).

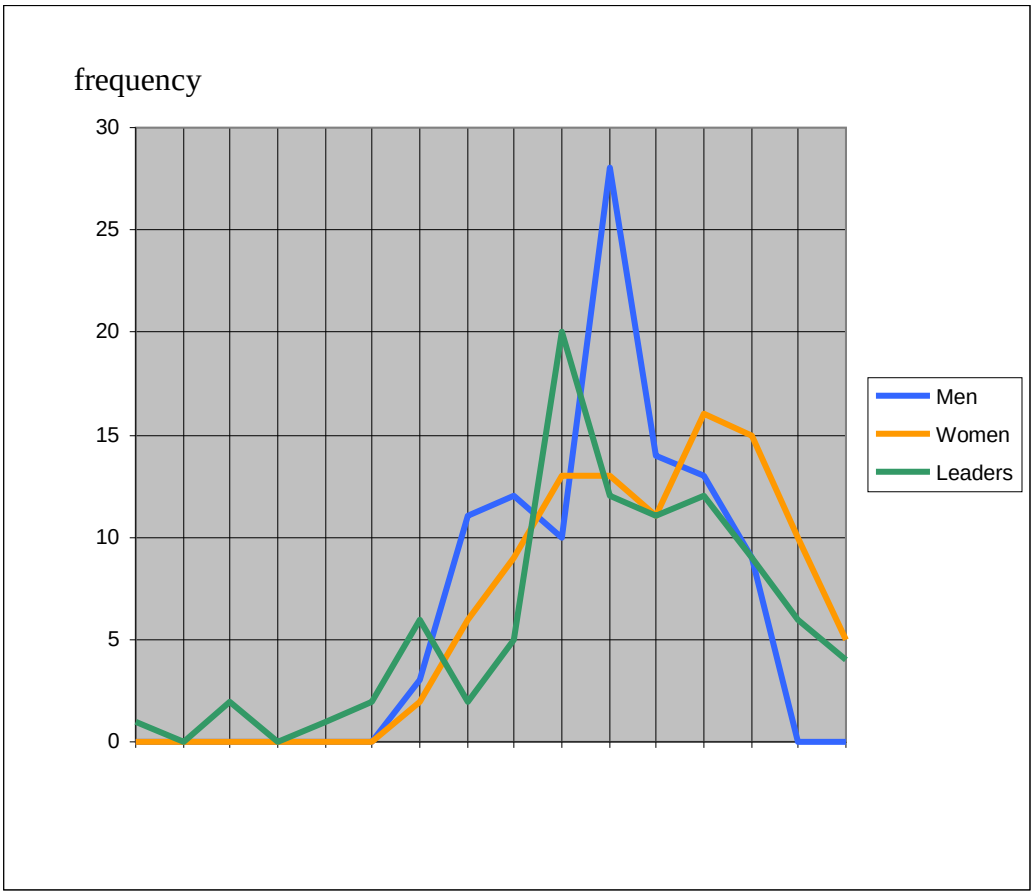

Fig. 2.11. The need for regardfulness

The leaders' scores are between 6 and 13, which are slightly less than the scores for non-leader men, who scored between 7 and 13 (average scores). The average for non-leader women is between 9 and 14. These score increase with age by 1 to 2 points. So non-leader women scored the highest, followed by non-leader men, and lastly by the leaders.

People with higher scores tend to be caring individuals who help others because they are motivated by love. Those with lower scores tend to be reserved, neglectful and less empathetic. The need for regardfulness manifests itself not only towards people, but towards animals as well.

1.10. The need for order.

We might wonder whether the order and cleanliness of our surroundings is the result of an instinctual need deeply programmed within us (Figure 2.12). A broader definition of this term could include the need to order knowledge and memories, and the need for unification. We try to understand the order of the world we live in.

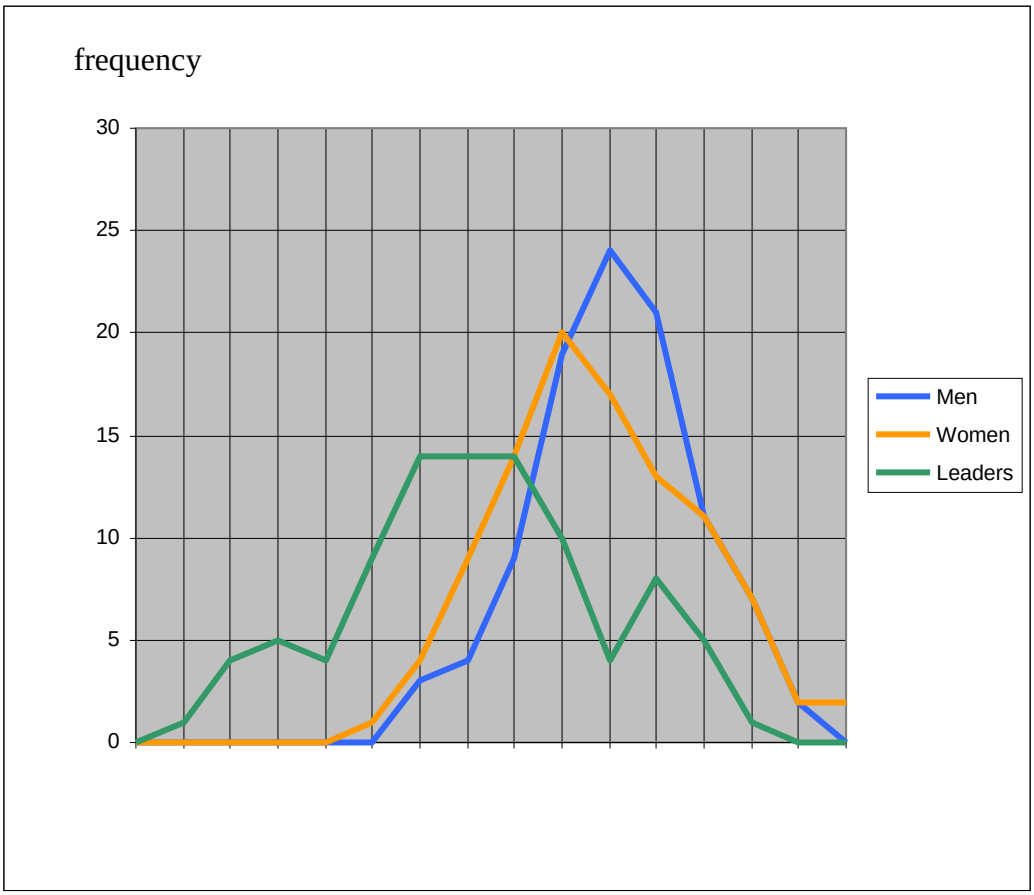

Fig. 2.12. The need for order

90% of Hungarian leaders have an average score of between 3 and 11. Non-leader men scored between 8 and 13, while non-leader women had an average of between 8 and 12. The deviation of leaders is quite high compared to non-leaders, and their average score is also much less.

Higher scores indicate an increased need for order and cleanliness. Extremely high scores can indicate mania.

Very high scores are often characteristic of rational, intelligent, but introverted people who are sometimes prone to worry.

Those with lower scores are often unconstrained, unfocused and unambitious. There is a need to underline again that extremely high or extremely low scores do not mean abnormal or less valuable people. They simply mean that we are different from each other.

2.11. The need for help.

This motivation means that, when we are in trouble, we need the help, care and empathy of others. The need for help does not have a sexual content (Figure 2.13).

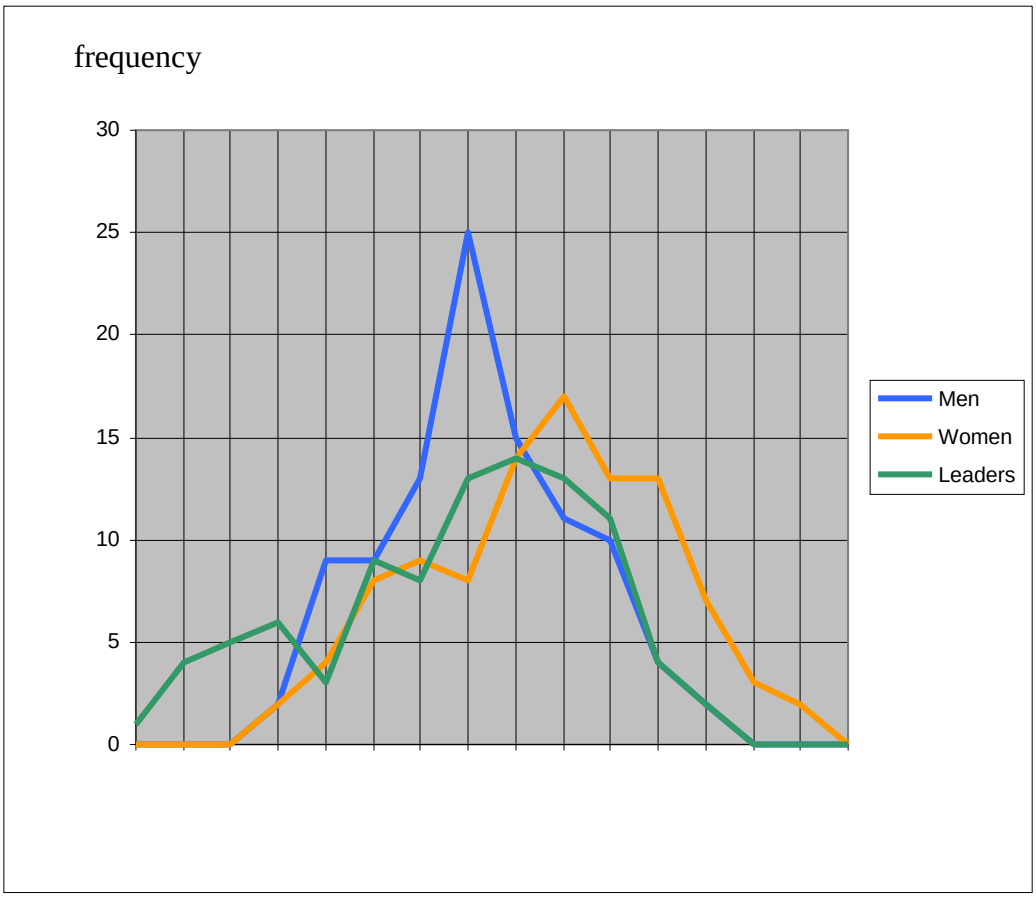

Fig. 2.13. The need for help

90% of the leaders examined have scores of 2 to 10. The average for non-leader men is between 4 and 10, and for non-leader women it is between 5 and 12. There are hardly any changes with regards to age. The group with the greatest need for help is non-leader women, followed by non-leader men, and lastly by the leaders.

People with high scores tend to depend on others, and they worry if they have to face problems alone. It is clear this motivation has a biological aim.

Persons who have lower scores become withdrawn and hide when they fail or get sick. Some of them are disposed to fake illness in order to get the help they so desire from others.

The results related to secondary factors, are shown below.

The need for self-justification.

This drive is characteristic of the so called "*neurotic"* type. Those with higher scores tend to consistently fail and experience great frustration (Figure 2.14).

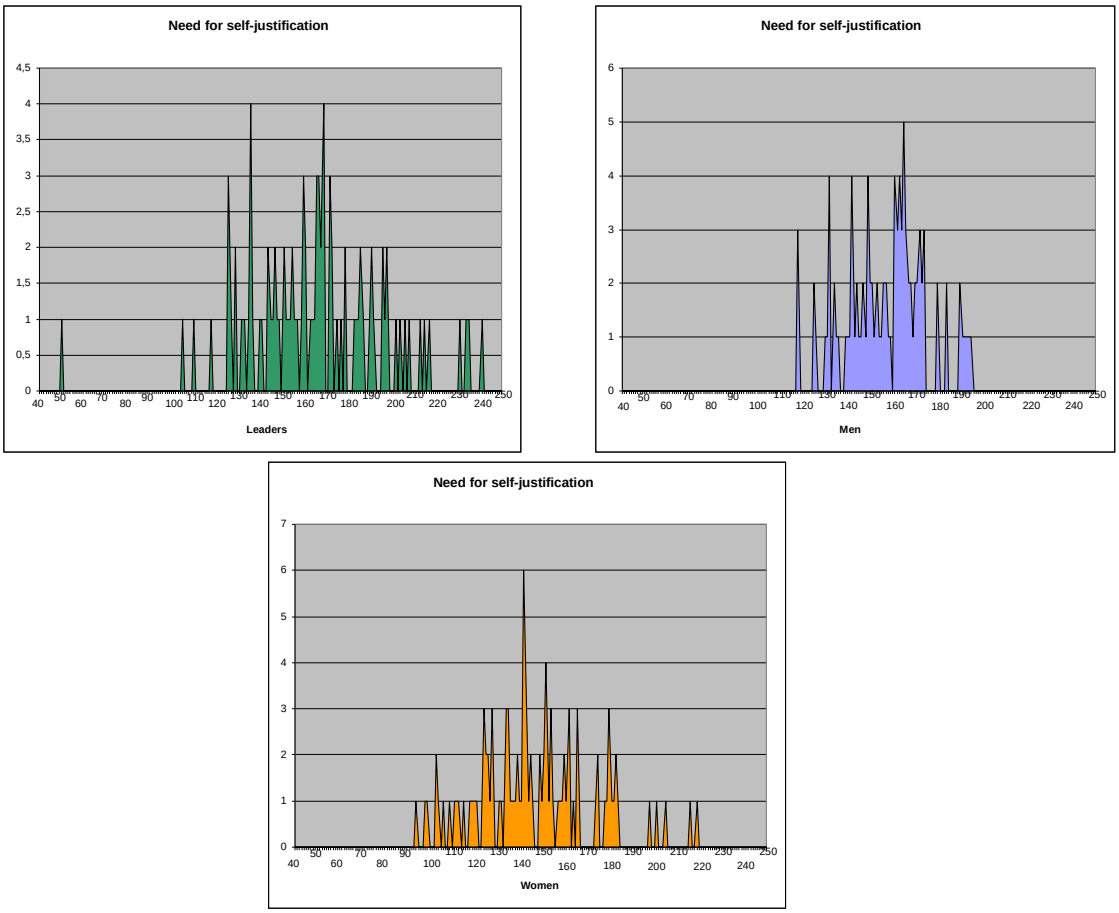

Fig. 2.14. Secondary factor need for self-justification

90% of Hungarian leaders got scores between 126 and 216, while non-leader men scored between 120 and 165. So it seems that this difference between these two

classes of males indicates that this feature is more important for leaders than for non-leaders.

Higher scores indicate a mixture of the desires for defence and attack. This manifests itself in phenomena such as the need to defend our values against real or imagined offences, the need to prove that our beliefs are true, and adherence to our ideas and our background.

Lower scores may indicate passivity, and a tendency to withdraw from other people and the world. Some people accept their low level of self-respect and build it into their self-image.

Rational dominance.

Rational dominance (Figure 2.15) can be defined as the desire to overcome others by the use of instruments such as arguments, power etc.

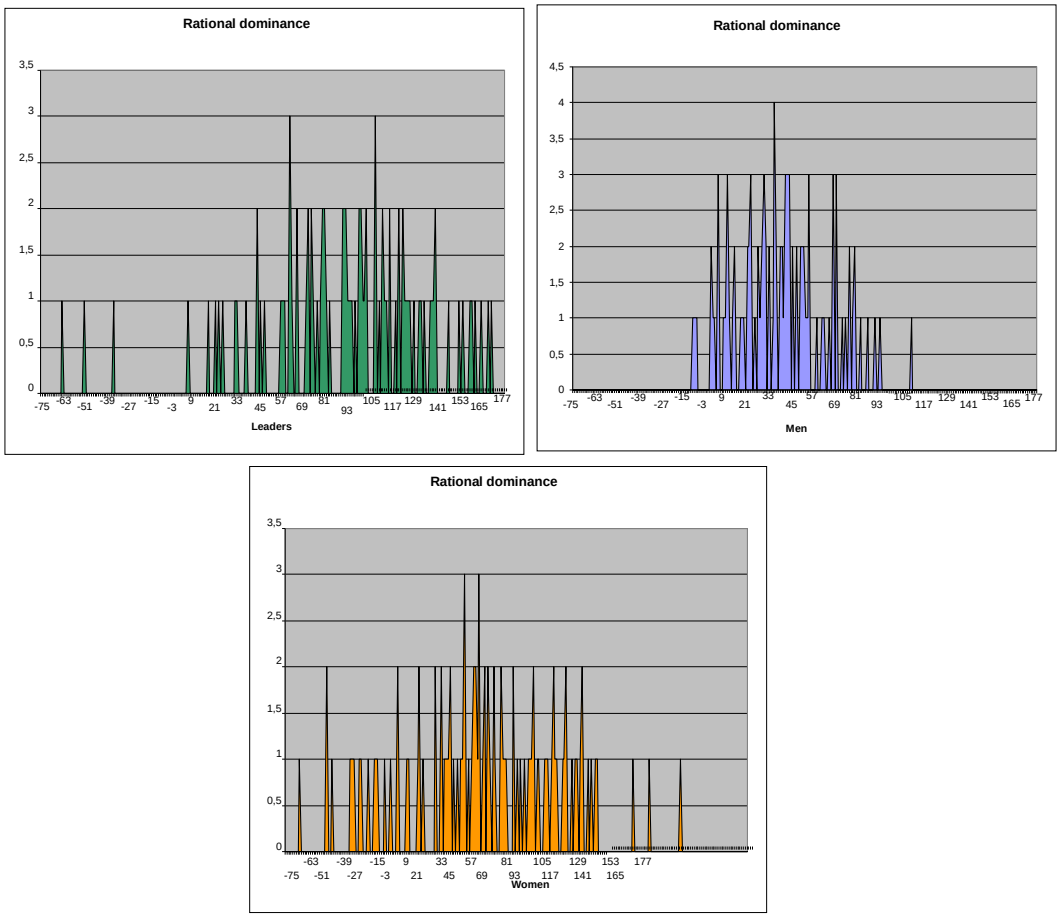

Fig. 2.15. Secondary factor of rational dominance

Rational dominance also includes the need for success, the need to compete and the need to manage others. The average scores of Hungarian leaders are between 22 and 160. Non-leader men scored between 10 and 65, and non-leader women between 5 and 40. There is a significant difference between men and women. Scores greatly decrease

with age, and women can have scores as good as 0 to 10. We can detect even more significant differences between leaders and non-leaders, because, as our hypothesis states, leaders have much greater needs regarding rational dominance. People with higher scores are competitive and have a need for success. They strive to overcome others, even unfairly, and often at the expense of other human values like care, love, empathy etc. This is especially true of individuals with scores from about 90 to 100.

People with very low scores – especially in the minus range – tend to be unassertive and quiet. They do not enjoy fighting and competing, but instead have other kinds of values. Therefore, there is a significant decrease in the need for rational dominance with age, because the time for fighting passes.

Aggressive non-conformity.

Aggressive non-conformity (Figure 2.16) can include traits such as rebelling against social traditions, conventions and values.

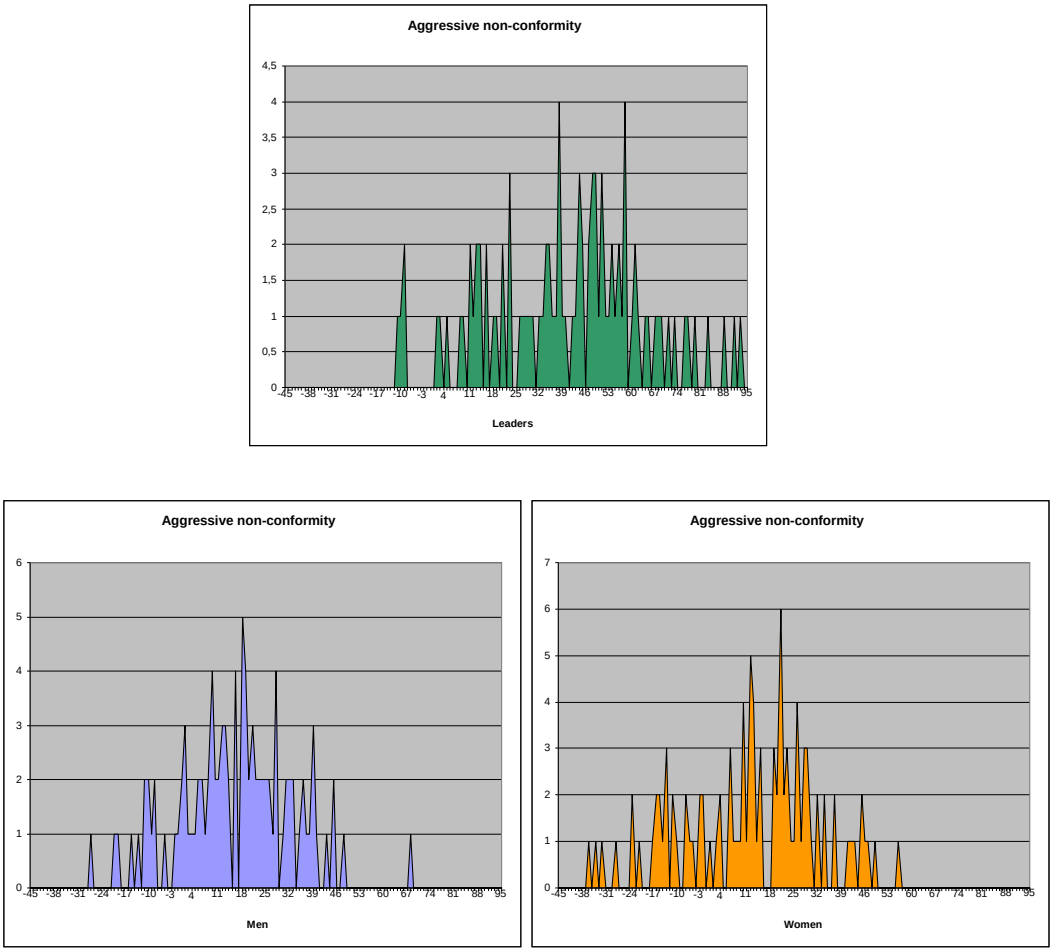

Fig. 2.16. Secondary factor of aggressive non-conformity

It can also mean following one's individual intentions and wishes, and creating and following one's own rules, if necessary by force. In addition, it can include a general

refusal to obey every type of order and authority, and a tendency to rebel against expectations and official institutions.

Hungarian leaders got scores of between 3 and 78. Non-leader men scored between 5 and 22, and non-leader women between 10 and 23. So, we can see the trait of aggressive non-conformity is more pronounced amongst leaders. Higher scores indicate people with the needs mentioned above: in other words, the desire to have one's own way against other people, society and traditions, whatever it takes.

Those with lower scores tend to be accomodating individuals who behave in a respectful manner and are good at making adjustments. Aggressive non-conformity is usually the driving-power behind development and innovation. On the other hand, those with lower-end scores are likely to be people who help to achieve and maintain peace, harmony, warmth and safe human relations.

Passive dependency.

Passive dependency (Figure 2.17) can include behaviour such as striving for safety, letting others make decisions in important situations, the preference for dependence in order to have safety, and hiding behind other people so as to avoid the weight of responsibility.

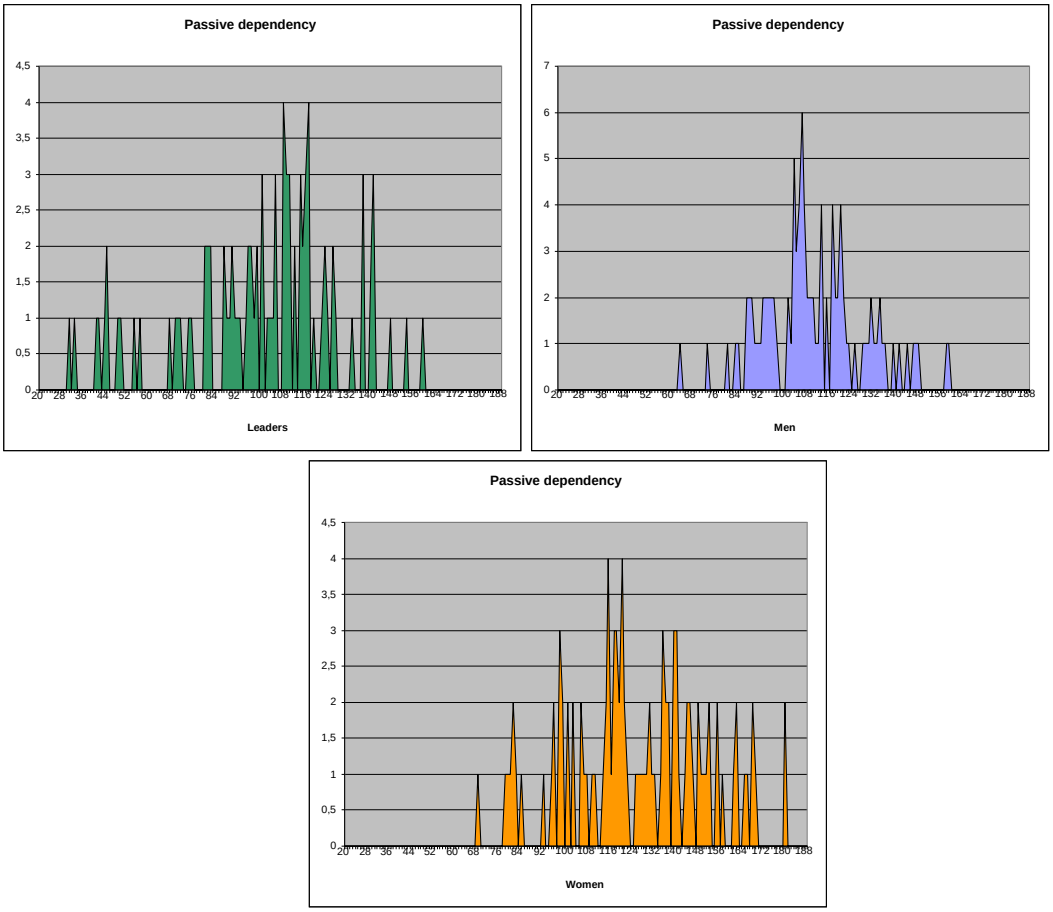

Fig. 2.17. Secondary factor of Passive dependency

Passive dependency is a very common human feature. This might seem contradictionary, but we humans are contradictionary creatures.

90% of Hungarian leaders got scores of between 45 and 142. Non-leader men scored between 85 and 125, and non-leader women between 100 and 140. There is virtually no change with regard to age. So, the qualities of independence, high performance and assertiveness are more important for leaders than safety and the need for regardfulness.

Higher scores indicate people who are willing to give up their independence for a safer environment.

Those with lower scores have a need for independence, a need to perform successfully, and a desire to be in the centre of attention in various situations.

Sociability.

Sociability (Figure 2.18) can include the need to be feel one is a social being, the need to belong to a group, and the need to share common activities with others. Sociabilty can also include emotional intelligence, coupled with the capacity for tolerance and warmth.

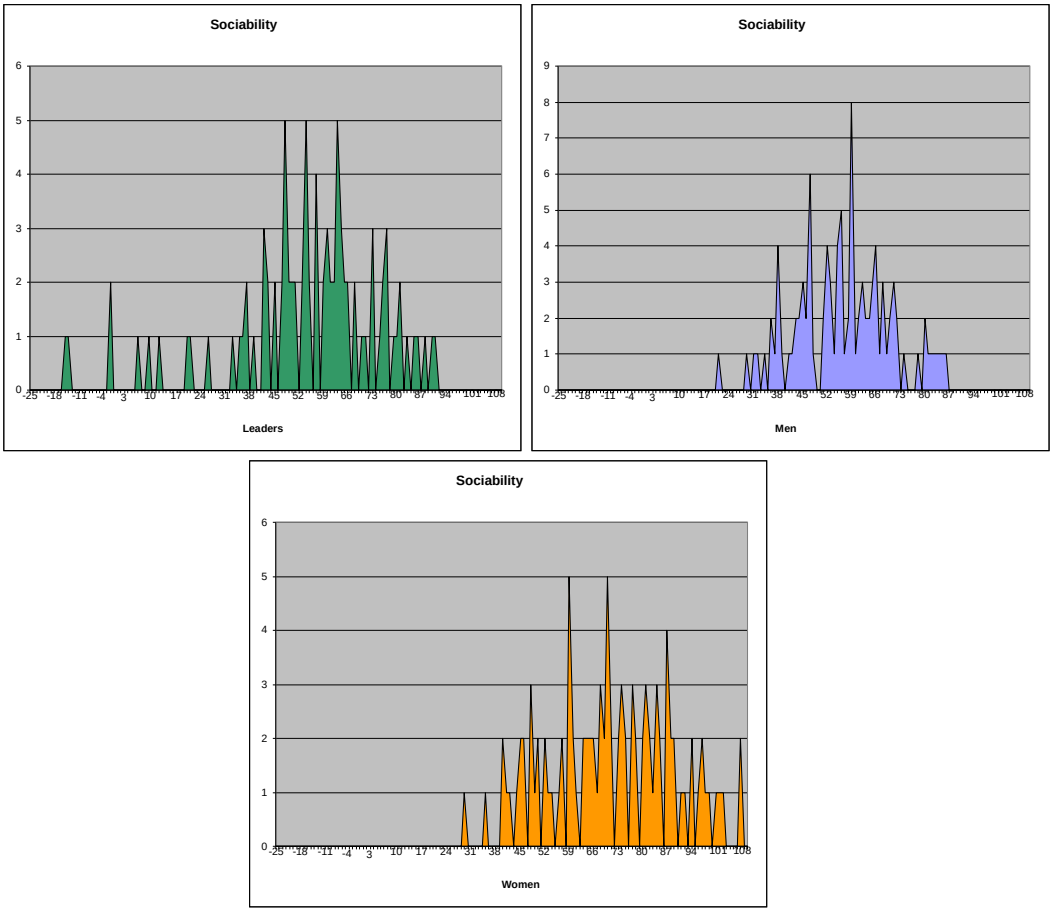

Fig. 2.18. Secondary factor of sociability

The average scores of leaders were between 7 and 84. Non-leader men scored between 40 and 80, and non-leader women between 55 and 90.

People with high scores are likely to be sociable, open, relaxed, and friendly.

Those with lower scores may often feel the odd man out. They are introverted peope who prefer dealing with facts and objects. People with very low scores are often dreamy individuals with a poor grasp of reality.

The disposition to say "yes".

This is the measure of how far we tend to say "yes" rather than "no" to various questions (Figure 2.19).

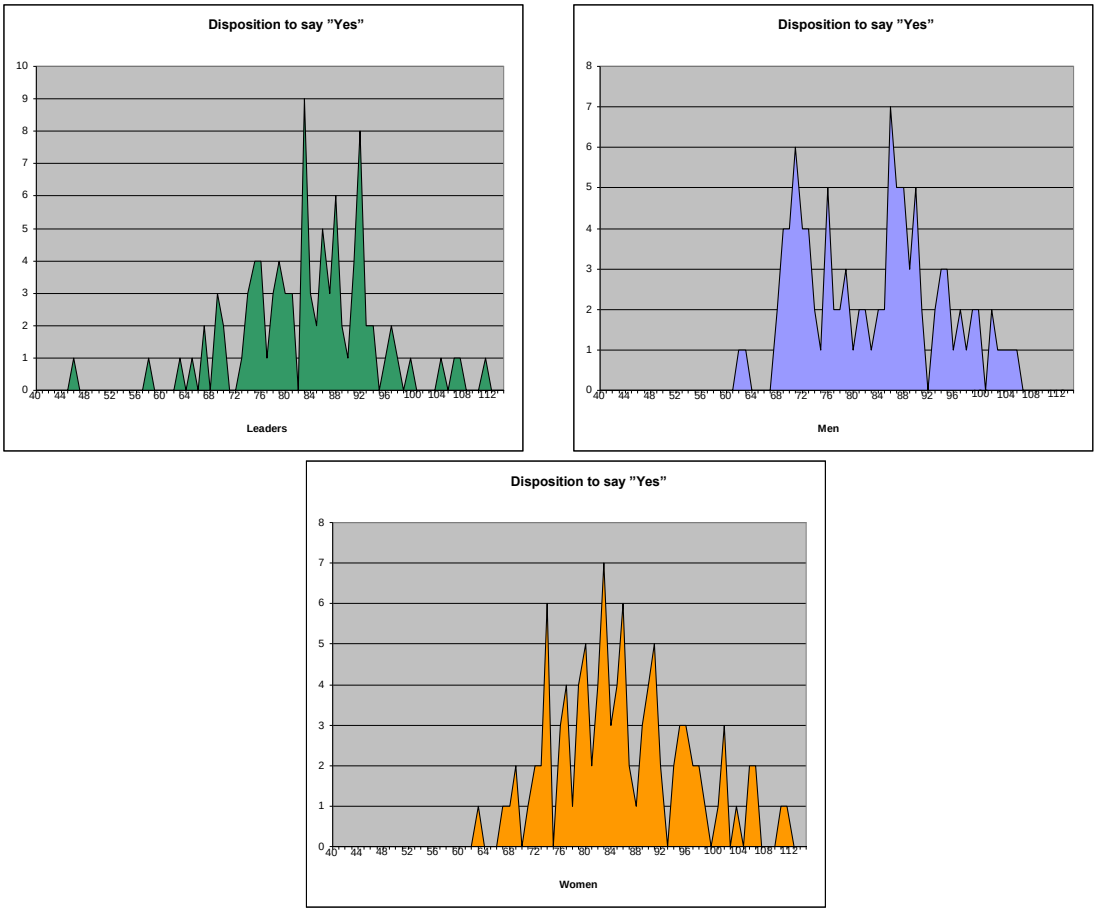

Fig. 2.19. Secondary factor of the disposition to say "yes"

The average score is somewhere between 60 and 100, while 90% of Hungarian leaders got scores of 68 to 99.

If your score is above this, you tend to say "yes" in various situations, so you are a rather accomodating person who likes to agree and accept.

Scores below 60 – and particularly below 45 – indicate rather rebellious, bull-headed people who often refuse, argue and protest. This factor is not a real "psychogen need", but only a by-product of the test.

By analysing the test-results, we can explore different personality traits that could be of interest from the managerial point of view.

On the basis of the 17 traits examined, the following list shows the significant differences that were found between leaders and non-leaders. So, leaders:

- have a higher motivation for performance
- have a greater need for dominance
- are more exhibitionistic
- place a higher value on autonomy
- have a lower need for regardfulness
- have a lower need for help
- place a higher value on self-justification
- place a higher value on rational dominance
- have higher scores regarding aggressive non-conformitivity
- have a lower level of passive dependency

There are no big differences concerning the factors below:

- the need for affiliation
- the need for defence
- the need for scrupulousness
- the need for sociability
- the disposition to say "yes".

These findings can be built into leadership development programmes, in addition to coaching education and coaching practice.

2.3 Enterpreneurs' human capital in creative industries

Different types of capital, financial, human and social, have been found to contribute to start-up activity and entrepreneurship success. We will look at a single type of capital - human capital in the field of creative industries. It has been found that the general interest of university students and young graduates in creative fields of entrepreneurship is low and enterprises founded have often little relation to the

owners' academic expertise. One of the reasons is that graduates from creative fields do not have enough business competences.

What characterises the creative industry is that the sector is fragmented and comprises a large number of small enterprises. Therefore, the characteristics of small enterprises apply to the creative sector. Many people working within the creative industry are self-employed or work sometimes part-time in addition to full-time salaried occupations and many are driven by quality of life imperatives. It follows that their dedication to business management is low and they often lack time for business processes. (Jones et al, 2004, 134).

Small and medium-sized enterprises (SMEs) face a number of growth barriers like difficulties in obtaining finances, the level of and decrease in demand, tightening competition, restrictions determined by authorities, problems in obtaining skilled workforce, small number or lack of potential cooperation partners, unwillingness to grow due to the entrepreneur's fear of losing his/her autonomy, difficulties in fitting personal and firm's goals, and weak managerial or marketing skills (Pasanen, 2006, 8). So the SMEs, including the ones in creative industries, have problems also with human capital in terms of certain entrepreneurial/managerial knowledge and skills.

Attention has shifted in research from personality traits of entrepreneurs to their previous employment and entrepreneurial experience that influence the foundation and growth of new ventures (Madsen et al, 2003, 426). A meta-analytical review by Unger et al (2011, 343-346) found that in studying human capital a large spectrum of variables has been used: formal education, training, employment experience, start-up experience, owner experience, parents' background, skills, knowledge etc., whereas education and experience have been found to lead or not to lead to knowledge and skills.

More specifically, human capital has been seen as consisting of education and experience (Honig, 1998, 374-376), both of which can be divided into general and specific (Becker, 1975, 1993; Gimeno et al, 1997, 756-758). Contents of general and specific human capital is seen differently by various authors according to the purpose of their studies. According to Madsen et al. (2008, 73) general education means college, university or business education and language skills (non-entrepreneurial training) and specific education consists of specialist, technical training like PhD in Computer Science, Engineering, Biology, including also participation in entrepreneurship classes ofvarious types. General experience can be understood as experience from previous jobs or job training (non-managerial positions), and

specific experience means previous entrepreneurship and managerial positions in the context of knowledge-intensive ventures. Dimov and Shepherd (2005, 7), on the other hand, view business, law and consulting as specific education and experience, and humanities, science, and running an entrepreneurial firm as general education and experience in the context of venture capital firms. In the current study human capital in the field of entrepreneurship is analysed therefore non-entrepreneurial/managerial training and experience is seen as general, and different kind of entrepreneurial/manage- rial training and experience is seen as specific.

Although studies have shown that a large part of entrepreneurial learning in SMEs is experiential and pre-start courses might have a limited effect, their value lies in preparing entrepreneurs to take advantage of their experiences, to reflect from experience and to absorb knowledge from learning events (Deakins and Freel, 1998, 153-154). There is a number of issues that have to be taken into account in entrepreneurship education in order to successfully combine business and creative disciplines. Educational institutions should be aware that cultural entrepreneurs are interested in modular, flexible and demand-led education, in distance form and taught by peers (Leadbeater and Oakley, 1999, 42-43). There is a need for closer relationships with external organisations, industry and practitioners (Carey and Naudin, 2006, 522525) as the skills needed by creative entrepreneurs are wider than the term "entrepreneurship" generally contains and include a range of "soft" skills such as communication, team-working, customer handling, presentation, project management etc. (DCMS, 2006, 21). Another aspect is teaching methods as sometimes in creative fields students expect high professional competency, a unique type of communication, multifaceted learning methods and interactivity (Hagg, 2008, 23).

We will analyze the opinions and assessments of owners/managers of creative industries about their human capital strengths and weaknesses in the field of entrepreneurship in 4 Baltic Sea region countries — Estonia, Finland, Latvia and Sweden, as well as will identify the ways of contributing to the development of human capital of creative entrepreneurs through entrepreneurship education.

It's importent to linking knowledge and innovation to sustainable economic development and competitiveness of the proramme area, and the development of the best practice model of entrepreneurial education for creative industries in the Baltic Sea region universities. This allows universities promote entrepreneurial thinking among young people, support innovative business start-ups in creative industries and

their development into growth companies, better cross-border interaction in innovation, development of creative clusters and joint marketing.An attempt was made to conduct the study according to the principles of analytic induction during which the researchers seek to find universal explanations of phenomena by pursuing the collection of data until no cases that are inconsistent with a hypothetical explanation of a phenomena are found (Bryman, 2004, 400). However, the boundaries of the sample size were pre-given by the Interreg project proposal, this has to be taken into account.

The sample consisted of 74 creative entrepreneurs from 4 countries divided as follows: 21 from Estonia, 25 from Latvia, 21 from Finland and 7 from Sweden. The criteria for selection of respondents were that they represented as different areas of creative industries as possible. The classification of creative industries for the purpose of this study was compiled linking the Finnish and Estonian government classifications of creative industries to include the following sectors: architecture, visual/fine arts, performing activities, audio-visual activities, design, entertainment IT, cultural heritage, music production and event services, advertisement and marketing communication and interdisciplinary sector.

For data collection structured interviews were carried out based on the previously developed interview guide. Interviews took place in the form of face-to-face contacts, the answers were recorded and later transcribed and then interview summaries were translated into English in order for the data gathered in different countries to be available for analysis. During the interviews information was gathered about the background of the interviewees and the enterprises, the motivation of becoming an entrepreneur and future plans, the problems and support received at the start-up phase, the state, plans and problems related to the internationalisation of business activities, relevant entrepreneurial knowledge-skills, strengths and weaknesses, participation in entrepreneurship courses and their assessment, and the way entrepreneurship education for creative industries should be developed.

The method of data analysis was thematic content analysis (Anderson, 2007) of the interview data based on the categories derived from the literature review. In terms of strengths and weaknesses and the ways of developing human capital of creative entrepreneurs, the theory of human capital was applied, which distinguishes between education, experience, knowledge and skills as sources of human capital.

The creative entrepreneurs who were interviewed were mostly 18-35 years old, followed by the age group 36-50, were owners/ managers of their enterrises, they had

higher education, were obtaining it or had vocational education, had participated in entrepreneurship courses either at school or in the form of suppleentary trainings. The enterprises were SMEs, with mostly less than 10 employees and often with only 1 employee. Estonian, Latvian and Swedish enterprises were mostly start-ups (1-3 years), some Finnish enterprises have been existing longer — over 5 years, the businesses were all domestically owned, belonged to various fields of creative industries, with a turnover generally less than 2 mln. euro.

Strengths of entrepreneurs in creative industries in terms of human capital. The creative entrepreneurs thought that their strengths could be found in various areas of education and experiences, knowledge and skills.

Education was seen as strength in terms of entrepreneurship knowledge, including finances, marketing and business processes like "finance management, ability to budget things", "customer orientation", "selling skills" and "business understanding". Management and inter-personal communication were seen as strengths in relation to "leadership skills" and "great team and affirmative attitude", "good communication skills" and being "good negotiator, performer". Knowledge of sector and industry was an area where entrepreneurs felt secure meaning "knowledge of own product" and "understanding my field thoroughly, seeing the complete picture". And also foreign language skills were seen as strengths, e.g. "additional strengths that probably will prove to be beneficial as compared to the current players are language skills".

The knowledge that the entrepreneurs emphasised most were more general than specific in terms of human capital in the field of entrepreneurship. Most strengths were associated with communication and social skills like having a great team or good customer relations. Another aspect of knowledge was professionalism, understanding thoroughly the field one works in. Still, marketing and management as specific knowledge were also seen as strengths.

Experiences were also seen as strengths as they increase the chances of succeeding in business, e.g. "now I know how to do it in a right way and I teach employees, the other one is that ... I can substitute any employee" and "experience in advertising". Again, mostly general experience in the sector or industry where one is working, were seen as strengths.

Also abilities and skills were seen as strengths meaning market orientation like "can and wants to step into the client's shoes"; also creativity and flexibility like having "plenty of ideas", "being versatile", having the "ability to make adaptations";

then management and organisation like "ability to set a clear vision", "ideas, the ability to realize these ideas, the ability to predict trends in the society", "understanding employees, professionalism"; and finally motivation like "ability to make work exciting and get a self-excitement of it".

Creative entrepreneurs found their abilities and skills mostly in being creative and flexible, which can be seen as general in terms of human capital. Still, specific skills, like management, were also seen as strengths.

Weaknesses of entrepreneurs in creative industries in terms of human capital. The main weakness for managers in creative industries was that they didn't feel like traditional businessmen — "making a lot of money fast" wasn't the main goal. Weaknesses were found in lack of education and experience, lack of certain knowledge and skills.

Lack of education and knowledge in different areas was seen as a major weakness in terms of understanding the business environment like in case of "legislation" and "predicting the growth of population in the municipalities". Not having the financial management, marketing and entrepreneurship knowledge was perceived as a weakness in terms of e.g. "missing knowledge about basic things like accounting" and "weak in looking for sponsors", also due to the fact that "it is very difficult to sell something that you have created yourself' and also "V. does not have a business education, which she finds lack of knowledge".

Also management and interpersonal communication was seen as a weakness, e.g. "lack of strategic thinking and planning", "persuasion skills and ability to clearly communicate the vision and standpoint to clients". Having weak knowledge of the sector was recognised as a shortcoming like "lack of knowledge about music industry" or "the knowledge of the art sector could be better". In addition, poor language skills created problems as "English language skills also could be improved".

Entrepreneurs found that they had weaknesses in specific areas of human capital like entrepreneurship and management knowledge, but also in general areas like business environment, knowledge of the sector and language skills.

Lack of experience was a problem in the sense of experience in entrepreneurship and previous work-experience in the field: e.g. "I do not have economic understanding as well as good business experience", so both specific and general experience was a problem.

Lack of certain abilities and skills was seen as a weakness like lack of market orientation or "unwillingness to do what is the most selling thing"; also being too

creative and lacking self-motivation, e.g. "E. is sometimes too innovative, sometimes she needs to concentrate in the projects better" and "laziness to some extent, because, as there are almost no deadlines and day-to-day tasks set, one needs to self-motivate a lot"; making managerial and planning mistakes and having problems with financial matters like "weakness for the whole company is the very divisional tasks, such that one cannot help or substitute another" and "I also am very bad at time planning and I can't separate important things from unimportant" and "working with numbers".

Weaknesses in abilities and skills were found both in terms of specific and general human capital. The specific problems were with management and financial planning, and general weaknesses were found in being too creative and flexible, having problems with motivation.

How to develop human capital in the field of entrepreneurship? Managers in creative fields thought that the best way to develop human capital in the field of entrepreneurship was to some extent through education, but mostly by using a combination of education and experience or just experience on its own. Communication and networking, but also personal characteristics and background were seen to play a role here.

Education was seen as an important component in acquiring entrepreneurial competences. But education on its own is often not enough, positive attitude towards work and entrepreneurship is needed, also common sense and persistence, and having talent is important. Education can help with: "social skills", also with "some practical skills, as learning how to write projects correctly for getting money, can be studied academically".

The preferred variant was education and practice, academic education on its own was considered somewhat unsuitable to prepare for such a practical activity as entrepreneurship. Practical experience is needed before starting to learn something. One of the best ways to obtain entrepreneurial knowledge and skills is through a combination of learning and life and professional experiences as these two complement each other, e.g.: "high quality education together with regular practice as one cannot learn music management from books". Studying in different programs and learning-by-doing were proposed by entrepreneurs as options for obtaining entrepreneurial knowledge and skills. It was also emphasized that education and training should always pay attention to putting the knowledge-skills into practice.

Experience and practice itself are also important in obtaining entrepreneurial skills. It is beneficial to have some kind of experience before starting an enterprise,

like working before as a self-employed person or being employed by someone else: "it doesn't even matter what the education is, one should also have practical work experience before taking the risk of becoming an entrepreneur". Learning from practical work was thought to be beneficial because: "the academic skills need to be re-learned and somewhat re-invented once applied in practice".

Sharing experiences and communication contributes to entrepreneurial competences as well by raising confidence and motivation. It helps to be involved in different networks, getting to know other people's experiences, obtaining knowledge from experienced entrepreneurs as "you learn by talking to other people", "it is good to hear about other people's experiences".

But there are also opinions that entrepreneurial competences depend solely on the background or entrepreneur's personality and therefore cannot be learned, "you have it or not, if you don't have it and the skills, you would not make it — it's a natural selection, you cannot learn them".

How to develop entrepreneurship education? The creative entrepreneurs found that the content of education either at school or as continuing education should be wide covering politics and law, principles of entrepreneurship, accounting and financial planning, marketing and sales, management and interpersonal communication. Business trainings should be connected to the field of the participants enforcing certain traits and values. Knowledge provided should be usable in practice. Teaching and learning methods should inspire learning.

One area to be included in entrepreneurship education is business environment including politics and law. Legal matters should cover such topics as concluding contracts, having your rights protected, regulation of confidentiality, intellectual property rights, copyright issues, patents, trademarks, and the changing nature of business laws since: "the practices are different country by country" and it's important "especially for creative people".

Entrepreneurship should be included in the training on such topics as how to start a business, business models, how to find a business idea and customers, writing a business plan, what kind of businesses are successful, differences between private limited companies and self-employed persons, where to find investors, financial support opportunities and how to apply for them, evaluating business value, price creation, market behaviour, meaning "real solutions, where to find investors, how to do art in accordance to entrepreneurship".

Finance was another area to be included into such courses. Accounting, taxation and financial planning, various financial projects were important because "it is extremely difficult to creative people". Understanding the market was important. Marketing included public relations and strategy, a guidance to follow: "as artists are quite chaotic — some kind of formula or guidance to stick to, marketing, reminding what not to forget when trying to save time".

Another area of knowledge to be included was management as entrepreneurs needed presentation, communication and negotiation skills, knowledge of team management, human resources management, organisational behaviour, delegation of work, employee motivation, and business administration and the ways to increase efficiency at work. According to a respondent: "client relationship, identity of your company, professional identity, see the difference of yourself from the company, how to network, how to co-operate with other people and companies, how to contact them".

The course should not be too wide, but connected to the field where the participants were working. They should be connected to creative industries. There is also the need to get information about the latest developments, technologies and technical approaches, new products and materials of the field as these are constantly changing. Knowledge of the sector is needed as: "technologies are constantly changing and new technical approaches in architecture are constantly developing", "new materials and innovative products are produced".

Training should pay also attention to entrepreneurial characteristics and capabilities like "responsibility and courage", "self-esteem", "creativity", "valuating your own work". The knowledge provided should be usable in practice, meaning there should be practical speakers, courses should contain information about real life problems and offer real solutions, training programs should contain mandatory internship, practical skills like writing EU projects should be taught, also other practically applicable aspects, like standards differences. It is because: "artists want to do something, they want to change something, talk about their responsibility in society, how to work as a company but still have their values as an artist".

As to teaching and learning methods, the study process should start from bottom-up, contain group works, have all equipment to see and try yourself, have qualified lecturers and guest lecturers who are professionals from the field, provide a list of related readings. According to a respondent: "the most useful were group works, they gave me skills and ideas which I remember and use even now".

In terms of entrepreneurship education the principles of entrepreneurship, accounting, marketing and management are important. But it was emphasised that an entrepreneur should also understand legal matters and politics, and be prepared for creative team management, networking and cooperation.

The opinions and assessments of creative entrepreneurs about their human capital strengths and weaknesses in the field of entrepreneurship, including ways of overcoming the problems and developing human capital through entrepreneurship education were analyzed.

The entrepreneurs in creative fields saw their strengths mainly in the areas of general education and experience like communication and social skills, professionalism and knowing one's field, being creative and flexible. The entrepreneurs felt more confident about their professional knowledge and skills than about their of managerial and entrepreneurial competences.

Weaknesses were recognised in both specific and general areas of education and experience like entrepreneurship and management, but also business environment, knowledge of sector, language skills, and lack of motivation. The main problem is the difficulty to balance artistic and business objectives, manage and plan effectively.

The best ways to acquire entrepreneurial competences and overcome weaknesses were thought to be education and experience, especially the combination of these two, also communication and networking, learning from experience of other entrepreneurs and from each other during a course. Experience was valued even more than solely academic education since practical knowledge of the field, first-hand understanding of business, contacts and prospective marketing channels were considered necessary before starting a business.

According to the respondents, the entrepreneurship courses should provide soft skills like communication, negotiation and conflict management in addition to more traditional entrepreneurship topics like financing and accounting, marketing and sales. Attention should be paid to the problems and needs specific for creative industries, ways to implement knowledge into practice for solving real problems, involving practitioners as examples of best-practice and enabling dialogue and peer-teaching among participants. But due to financial and organisational constraints choices have to be made in the provision of education. One of the variants is to provide at the beginning of university education a compulsory basic entrepreneurship course for creative students that would concentrate on general entrepreneurship opportunities and challenges, entrepreneurial desirability and intentions, then

continuing both in terms of university education and supplementary training with more specialised elective courses for people who regard entrepreneurship as a career choice or who are already entrepreneurs.

As to limitations, the respondents have reflected on their personal experiences in different contexts — countries, legal and social environments, educational institutions, which make drawing generalised conclusions and suggestions difficult. What could benefit business support structures and educational institutions that provide services to creative students and entrepreneurs is to review the suggestions that the respondents have made from the viewpoint of their institution and consider different alternatives.

These investigations were carried out in the framework of the project CREAENT, is to foresee the development of an initiative for networking and an entrepreneurship education module for creative industries.

Further research should concentrate on a more specific analysis of differences enterprises at different stages of development and various fields of creative industries taking into account the background characteristics of education and experience of the interviewed.

Chapter 3

THEORETICAL BASES AND PRACTICAL ASPECTS OF PERSONAL DEVELOPMENT

3.1 The analysis of modern teaching methods at higher educational institutions

The improvement of educational process efficiency is possible only on the basis of personalization of training-cognitive activity. The implementation of new information technologies in educational process has led to the emergence of new educational approaches and modes of study, which are based on electronic instrumentation of processing and data of information facilities.

Over the past five or ten years, technical teaching aids (TTA) have found wide application in all kinds of education and modes of study. As a result, the diversification of training techniques and methods has taken place in educational process. The experience of their organization and effective application has been gained at all stages of individual lifelong education. Educational innovations are presented in Table 3.1.

Table 3.1. The classification of educational innovations

Innovations in conditions	Innovations in products	Organizational-managerial innovations
Effective educational process (new content of education, innovative educational environments, sociocultural conditions, etc.)	Pedagogical tools, technological educational projects, etc.	Radical new solutions in the structure of educational systems and administrative procedures ensuring their operation

Important aspects of TTA application include data dissemination facilities (transmission and reception), which are necessary for the implementation of training process. It can be lecture room or any other classroom, telecommunications and

others. By the last is meant wire and wireless communication systems and the Internet.

Thus, it can be argued that TTA is not just the complex of technical means, which needed to carry out the educational process; it is an important aspect of any modern training process. Their efficient use is possible only on condition with thorough development of necessary guidance materials, implementation of scientific and practical researches.

The use of computerized tools allows receiving primary data by means of interactive training programs that help students to learn specific subject with certain competency degree. Having unlimited space and timeframes for information gaining, the listener of the program during the independent work process can be in the mode of constant consultation with various sources of information. Moreover, the computer permits continuously carry out various forms of self-control, which increases the motivation of cognitive activity and creative nature of training process.

The mode of study with application of computer tools is based on certain didactic concept, which includes following basic assumptions:

1. Training process is based primarily on independent cognitive activity of the program student. It is necessary to create such educational environment that in the maximum extent assists to detection of creativity of the student. First of all, it needs to afford maximum access to teaching information, wherein information resources are provided by means of remote access services through the Internet.

2. Cognitive activity of the students must have dynamic nature. Active participation in educational process defines especially by internal motivation, expressed in the desire to learn. Active training techniques, which involve communication between teachers and students within training program, belong to the group of educational methods called “Many-to-many” and is divided into role playing, debating groups, forums, project teams, etc. In distance learning, they can be effectively applied in virtual classrooms, where students are separated in time and space.

3. Education program needs to be personality-centered. This personalized training under conditions of mass demand is possible only on the basis of high education technologies, developed by the means of computer tools and technologies.

The emergence of powerful computer multimedia systems and interactive computer programs has become the basis for rapid development of distance learning (DL).

Interactive computer programs activate all human activities: cogitative, verbal, physical, which speeds up the process of assimilation of educational material. Computer simulators contribute to the obtaining of practical skills. Interactive testing systems analyze knowledge quality.

At present, specific typological model of educational editions system for higher educational institutions has become firmly established; it includes four groups of publications, differentiated by functionality, which determines their value and place in the training process:

– program- methodological (curricula and training programs);

– academic (teaching- methodological) (methodological instructive regulations, practice guidance, containing materials on teaching methods of academic subjects, studying of the course, the implementation of courseworks and graduation works);

– training (textbooks, educational guidances, lecture materials, lecture notes);

– auxiliary (practicums, problem books, exercise books, chrestomathies, reading books).

Information technologies permit to identify according to this criterion the fifth group: control (testing programs, data bases). Modern multimedia training course is not just interactive text (or even hypertext) material, it can be completed with video and audio materials and presented in electronic form.

In order to provide maximum effect of training, educational information must be presented in various forms and on various data carriers. It is recommended to include video, audio and printed materials into the training set. The availability of principal sensory modality of the student (primary channel of information perception) leads to the fact that one can easier assimilate information visuals, for others important role is played by the materials audials, for third is needed activity kinesthetics.

The basis for teaching materials (educational methodological complex) is its interactive part, which can be realized only by means of the computer. It includes electronic textbooks, electronic reference textbooks, training complexes (computer models, designers and simulators), problem books, electronic laboratory practicums, computer testing system.

Computer models, designers and simulators permit to solidify knowledge and obtain skills of their practical application in situations, approximating to real. This allows to use them as simulators of laboratory facilities, as well as for practicing of skills of modeling process management.

Electronic laboratory practicum allows to simulate processes, which run in the real objects under study, or imitate the experiment that is unrealizable in real conditions. Thus, this simulator can imitate not only the actual facility, but also the objects of study and the experimental conditions.

Remote laboratory simulator allows to study the processes, proceeding in studied real objects, or carry out the experiments on experimental facilities, which are located in remote access.

The application of information technologies allows to modify delivery methods of training materials, which traditionally are carried out within the lectures, by means of specially developed multimedia courses.

Therefore, the application of new information technologies expands the opportunities of educational process control. Multimedia courses provide didactical perspective tool, which can significantly increase the efficiency of educational process under certain conditions. Main conditions include taking into account individual characteristics of students, their level of competency and motivation, their compliance to educational requirements and training goals. The implementation of multimedia courses into educational process requires the definition of relevant pedagogical techniques. Consequently, the multimedia course as basic didactical tool must combine three components: the content of the educational material, training methods and learning technologies.

These components are inseparably linked with related to each other and create training system that allows to implement the process of individual self-education.

3.2 Organizational-methodological elements of the development of modern lifelong educational systems

The most important integrating principle of multilevel educational complex is the coherence of curricula and training programs of different levels and kinds of education, from general secondary education to postgraduate study, including further vocational education. Such approach ensures the highest possible academic mobility.

The main principles are formulated as follows:

1. The continuity of education, from general secondary to postgraduate (doctoral studies and postdoctoral research);

2. Free choice of learning curve;

3. Academic mobility ensures the opportunity of crossing between departments, which implement different types of education within the same degree;

4. The ability to simultaneous implementation of multilevel professional educational programs;

5. The implementation of "lifelong education" principle.

The following learning curves are available in accordance with described above approaches.

Basic higher education for obtaining Bachelor's degree:

1. General secondary education – basic higher education;

2. Basic general secondary education – vocational education – basic higher education;

3. Basic general secondary education + basic vocational education – vocational education – basic higher education.

Complete higher education for obtaining Master's degree:

1. General secondary education– basic higher education, Bachelor – complete higher education, Master;

2. Basic general secondary education – vocational education – basic higher education, Bachelor (facultative, reduced training program) – complete higher education, Master;

3. Basic general secondary education + basic vocational education – vocational education (reduced training program) – basic higher education, Bachelor – complete higher education, Master.

There are local degrees of education for ensuring academic mobility during whole period of study, which allow to cross within their framework.

It should be noted that **the modular principle of formation of curricula and training programs** allows not only facilitate the coordination, but also increase the number of local levels, which make possible crossing within their framework, by analogy with the principles of the Bologna agreement.

The important feature of proposed approach in conjunction with the modularity of curricula and training programs is the potentiality of crossing not only within fully coordinated local degrees, but also between different programs, such as Master and Specialist, with the elimination of certain modules.

The implementation of these principles requires high scale of agreement of curricula and and training programs within the local degrees.

The flexibility of educational path is ensured by credit based modular learning, in this case academic disagreement of fixed modules must be liquidated with the opportunity of giving credit for elective modules of different programs as the variable part.

Modular approach and credit system allow to identify fixed and elective courses as independent didactic elements of **continuing professional education**, which have independent significance as short-term training programs and as modules that compose large programs of professional retraining.

Accordingly, developed system includes organically all levels of primary, secondary and higher professional education, compliance training and retraining programs. Besides, all educational systems complement each other and allow free and logically arrange the educational path, in compliance with already obtained educational degree, student's desires, his financial resources, intelligent and temporal capabilities.

3.3 Development of methods and models of quality evaluation of professional and training programs for higher educational establishments

At present, the system of higher education adapts to the needs of enterprises (businesses, companies), however its modification volatility does not correspond to change speed in the economy. In such conditions native organizations have to spend too much time and resources on retraining of specialists (young professionals, recent graduates). In turn, new employees at the enterprises have increased adaptation period, this process becomes complicated by its involvement in working process.

Additional factors, contributing to improving the relevance of higher education institutions, are:

– demographic crises, which has involved the quantity reduction of prospective students, that in its turn has led to increasing of competition between universities at the field of state-funded and unbudgeted students and listeners of supplementary professional education programs;

– the beginning of convergence process of European education systems – Bologna process, which has the required parameter "Quality higher education control".

Aforesaid confirms the need for innovation changes within the higher education area, one of which is the implementation of a quality management system.

The implementation of quality management system (QMS) requires satisfying the conditions determined by:

– International Standards on Quality Control;
– Statutes in accordance with State Standards;
– Basic requirements stated at standards of educational institution.

Existing methods and approaches of quality evaluation of education services do not enable to comprehensive assessment of the different areas of university activities (particularly, financial and marketing activity), but also do not take into account their interference and their influence on the result of training program listeners. The main disadvantage of existing models of quality evaluation of educational activities lies in the fact that they are not able to identify sustainable dependence between educational program efficiency and management quality.

Above-mentioned disadvantages determine development need for mathematical models, which permit not only take into account the impact of management quality of the university on educational program efficiency, but also significantly reduce time expenditures for estimation, as a consequence of process automation.

The quality of education is determined by:

1. Management quality of the university activity – how effectively and successfully are the processes operating at the university.

2. The quality of knowledge obtained through the studying program by the students.

The competence level of the program audience, which is the result of university activities, is determined by its quality of the management of university activity processes.

It is effectively to employ following methods for quality evaluation:

1. SWOT – analysis, which permits to initiate strengths and weaknesses, opportunities, and threats for higher educational establishments.

2. Gap-analysis – can be used to organize the development of stages for achieving the given goal.

3. BSC (Balanced Scorecard) - the system of interrelated objectives and measures, which reflects the situation of the main activities of the organization (basic or promising BSC) and permits to establish the reasons for nonconformities in the processes at higher educational establishments.

Let us use BSC method in university performance appraisal, which has in comparison with other approaches, the following features:

1. The identification of failure within education process at higher education establishments.

2. Changing the BSC structure in accordance with the requirements of particular university.

3. Accounting of non-financial performance measures.

4. Using the BSC within government organizations.

For evaluation of knowledge and skills of student, it is proposed to apply the competency building approach, that involves the evaluation level of student achievements of the program set of competencies, and which has a number of following advantages:

– The acquiring of such knowledge by the students, which they will be need in their further work;

– The requirements accommodation of labor market during the learning program preparation;

– The unification of the approach to the knowledge evaluation of graduates based on standard requirements to their competencies.

According to the classic concept of the BSC, the appraisal of the organization is based on four constituents: financial activity, customers, organizational processes and personnel. Developed BSC template includes eight following components, which represent key areas of university activity:

1. The educational process.

2. Research and innovative activities.

3. Management of higher-education teaching personnel (HETP).

4. Providing with teaching aids.

5. Social security and hardware.

6. Administrative personnel management.

7. Financial activity.

8. Marketing activity.

The structure of developed BSC template is based on the fact that the main university goal is not making a profit, it is provision of quality education programs to students, which directly depends on the efficiency of educational process organization. Thereby, the first place in the BSC template for higher educational

establishments, does not take the financial component, it is given to "educational process".

Whereas research results influence on the state of knowledge that students gain during the training programs, the perspective of “scientific work” ranks the second place at the BSC structure.

The quality of the educational process also depends from professional skills of HETP. Thus, "HETP management" component directly affects on the research results and, therefore, it must be placed under the "scientific activity" stage.

Components, positioned below, reflect the processes of university provision providing with teaching aids. In turn, the efficiency of administrative personnel management depends on the quality of the inner university processes. On this basis, the component "Administrative personnel management" should be placed below prospects, which reflect the providing university processes.

Financial activity takes its place among the other components at the second last stage in BSC structure. The last component of the BSC approach is "Marketing activity". This aspect makes enable the attraction of additional financing as a result from the attraction of unbudgeted students and enhancing university prestige in total and, consequently, permits to improve BSC components of the university.

The proposed BSC approach contains 28 goals and 52 indexes, which determine the rate of the achievement of objectives. The structure of BSC template can be completely changed within the adaptation during the applying process at the certain university.

The structure of “Competence Tree” may include the following blocks:

1. General cultural competence;
2. Professional competence.

It is proposed to use the “Competence Tree” structure, which has the following advantages:

– simplification of the process, by which appraises the level of competence development, received by the students during the learning program;

– taking into account the modular training system, that permits students to develop additional skills;

– reducing of time spending for competence model development through including of competence groups into the BSC template structure that are common to all fields of specialities;

– the ability to identify disadvantages both in theoretical and practical training programs.

Special and transversal competence block determines the level of obtaining the practical and theoretical competencies by the program listeners in the framework of training module, and provides the opportunity to attend free set of training modules, and, consequently, to develop the additional competencies.

Moreover, special competence block includes the group of competencies, which is responsible for knowledge and skill development that is obtained by the students during the learning process. Thus, the Competence Tree structure includes seven groups:

1. Standard competences.
2. Personal competences.
3. Personal competences in the fields of study.
4. Special competences in the fields of study (theoretical).
5. Special competences in the fields of study (practical).
6. Additional and transversal competences.

Mathematical model of the evaluation of educational activity quality, taking into account the relationship between BSC and competence model of the learning program, is proposed to describe through $\bar{x}$ and $\bar{y}$ vectors:

$$\bar{x} = (x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8), \quad (3.1)$$

$x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8$: the value of implementation degree of BSC components respectively, ranged (dialing according with relative scale) from 0 to 1.

$$\bar{y} = (y_1, y_2, y_3, y_4, y_5, y_6, y_7), \quad (3.2)$$

$y_1, y_2, y_3, y_4, y_5, y_6, y_7$: the value of competence group respectively, ranged (dialing according with relative scale) from 0 to 1.

In order to determine functional dependence between the vectors it is proposed to apply the connectionist approach. For the process of data preparation at the network input, it is used the algorithm of value definition of the degree of BSC component implementation. At calculations of value definition of the degree of $x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8$ respectively, each component has a set of goals from c_1 to c_m;

(where) m is the quantity of goals for x_l; l - component number (index number of BSC component).

The achievement of each BSC objective (c_{jl}; j - the goal number) defines by the condition of indexes ($p_{ij}^{'}$), which belong to certain goal, and by the degree of the implementation of mentioned objectives. In sum, the relationship between the indicators, objectives and components of the BSC can be described in general view as follows:

$$p_{ij}^{'} \rightarrow c_{jl} \rightarrow x_l, \tag{3.3}$$

Three possible statuses have been specified for each goal respectively:

S_1: the goal is not achieved;

S_2: the goal is achieved in part;

S_3: the goal is achieved.

The BSC objectives are located at different levels, but for all that the objectives of lower levels are related with the goals of upper level and influence on them. Therefore, during the calculating of achievement degree of BSC objectives it must be taken into account the values of the degree of the realization of goals, that lie at the lower levels.

Thus, the goal position is determined by the degree value of its implementation (c_{jl}), which is calculated as follows:

$$c_{jl} = v_{jl} \sum_{i=1}^{n} p_{ij}, \tag{3.4}$$

p_{ij} : the value of result index; determines by the values of p_{ij} indicators, which belong to j-th goal;

v_{jl} : the coefficient, that reflects the degree of the influence of the underlying objectives on considered goal and determines by the positions of objectives, which underlay the considered purpose;

n : the number of indexes, which belong to certain goal;

i : the index number.

Each BSC goal is characterized by several indexes. All indexes of certain purpose may have different weight in determining of achievement degree of this goal. In order for taking into account the difference between the degrees of impact of certain indexes on the objective, it is proposed to apply the Delphi expert method for estimation the weight of each of the indicators (k_{ij}).

By taking into account the weight (k_{ij}), the result index can be calculated by the formula:

$$p_{ij} = \frac{p_{ij}^{'}}{p_{ij}^{''}} k_{ij}, \qquad (3.5)$$

p_{ij} : the weighted value of i-th index;

$p_{ij}^{'}$: the value of i-th index, resulting from data collection;

$p_{ij}^{''}$: the standard value of i-th index.

The indicator is assumed to be:

1. Achieved, if : $\frac{p_{ij}^{'}}{p_{ij}^{''}} \geq 0{,}9$.

2. Incompletely achieved, if : $0{,}5 \leq \frac{p_{ij}^{'}}{p_{ij}^{''}} < 0{,}9$.

3. Not achieved, if : $\frac{p_{ij}^{'}}{p_{ij}^{''}} < 0{,}5$.

The values, defining the index status, are determined by expert method and can be changed.

For the calculation of influence coefficient value of the underlying objectives, it takes to count the number of goals, which correspond to S_1 and S_2 statuses. In this basis (reasoning from this fact):

N_1 : the number of objectives, corresponding to S_1;

N_2 : the number of objectives, corresponding to S_2.

Then the influence coefficient value is calculated as follows:

$$v_{jl} = 1 - (0{,}01N_2 + 0{,}02N_1), \tag{3.6}$$

The coefficients, equal to 0.01 and 0.02, were determined by experts and can be changed.

The final value of the degree of BSC component implementation has been calculated as the sum of the degree values of goal achieving:

$$x_l = \sum_{j=1}^{m} c_{jl}, \tag{3.7}$$

Within the selection of activation function, it is taken into account the fact, that the precise algorithms of the selection of activation function. Activation function of neural network simply reflects the approach of its developer to the consideration of the solving problem.

The advantage of proposed model is the combination of two approaches: competency building approach and BSC template.

Chapter 4

METHODOLOGICAL ASPECTS OF FORECASTING NEEDS OF LABOR MARKET

4.1 HR scorecard as a tool of improve labour productivity

The problems of strategic management, how to evaluate and formulate strategic directions of development potential, and problems of methodological of predicting outcomes of development strategies are important for modern enterprises and are analyzed through various aspects in a number of scientific works.

The employees in companies – their "human capital"—are one of the key drivers of their competitive advantage. It is widely believed that in the next ten years the primary source of competitive advantage for most businesses will continue to increasingly focus on the talent within the organization, which means that the ability to effectively manage the employee talent within the organization is becoming more critical every day. While management makes decisions continuously about how to invest in human capital, few companies have an effective process to measure the value created by this "most valuable" asset.

The long-term effective operation of any company, including an engineering firm, requires that its growth and development are determined by the right choice of strategic guidelines that allow the best way to realize the potential human capital and other resources of the enterprise. The strategy that the company selects must ensure sustainable economic growth and development of the company, increasing its competitiveness. Therefore, engineering firms are now faced with the task of development of effective management, including strategic management, in order to take the lead.

The Balanced Scorecard provides a system that leverages the traditional financial and efficiency measures. Available currently for Human Resources with metrics of performance from three additional perspectives – customers, internal business processes, learning and growth.

The balanced scorecard (BSC) is one of the most highly touted management tools today. The editors of the Harvard Business Review (HBR) identified the BSC as one of the most significant management ideas of the past 75 years. The BSC is now being

listed as a value methodology along with cost–benefit analysis and return on investment; it is being used to help change organizational culture; and several companies have reported improved operational efficiency and profitability as a result of using the BSC. Researchers have clearly stated that companies of all sizes are good at developing mission statements and strategies but poor at implementing operational strategies to achieve them, and that they are poor at measuring whether they are achieving their mission and strategy. The BSC addresses this problem by linking the mission to strategy and then translates the strategy into operational objectives and measures.

Aim of research is to identify what the current investments in employees match the strategic objectives of the business. The HR is organization a partner with the business to manage employees as assets. Management needs to pay attention that more information not just simple cost figures, but and need to track financial results while monitoring progress in developing our human capital and acquiring the talent and capabilities we will need for business success. Necessary research results on the formation and development of the components of Balanced Scorecard (BSC), namely component "development of personnel".

It must be noted that modern enterprises for sustainable development should be considered as a condition of the internal environment, as well as constant and variable conditions of an unstable external environment. At the same time we believe that the strategic development of the company has properties:

- cyclicity - a property that is to move from quantity to quality, new quality gives the further development, etc.;

- helicity - the property that is the change of the spiral, with different influences in the development of the object. Direction can be positive or negative for object development. There are both upward and downward spirals of development.

Consider the development of the organization as a positive impact of development, so that a negative effect or a negative development will lead, ultimately, to the liquidation of the company.

The overall system organization as shown in Figure 4.1 represents a set of elements of the internal environment that characterize the capabilities and limitations of a company, which through the development and implementation of strategic and operational decisions form the elements of the scope of the enterprise, describing the organization's activities in the environment of operation.

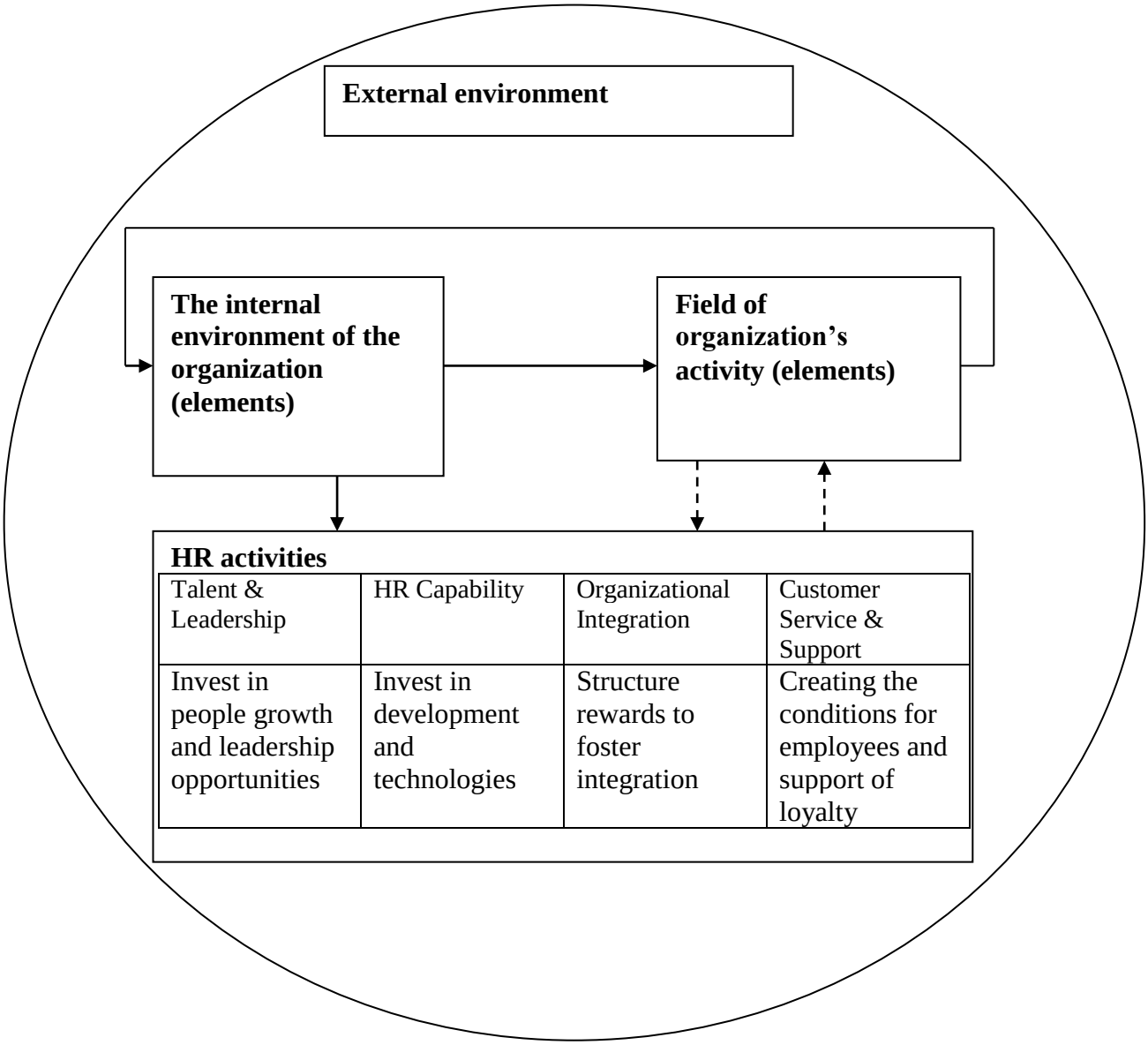

Fig. 4.1. HR activities in system of the organization

I

nforming about the possibilities of HR Scorecard all the organization's management and business partners is an important aspect of the successful implementation of the strategy of development of the staff.

To use the HR Scorecard special attention should be given to planning, measurement and analysis job. Should be developed systematic approach to communication and management training in accordance with the new management tool. Emphasis on the scorecard should focus on cost characteristics of tools and resources that are provided in connection with the strategy of business optimization.

It also served as a tool, which allows predicting and anticipating possible problems. Measuring effectiveness is an important component in the decision-making attachment to the results of the HR Scorecard.

Internal elements of the enterprise environment affect the formation of element areas that allow for better internal environment elements. The properties of the organization reflect the cyclical and helical development.

The elements of internal environment that characterize the capabilities and limitations of this company, in our view, should include:

- Raw materials (their quality, quantity, price, etc.);
- Technology (existing in the enterprise);
- The means of labor (fixed assets, their characteristics);
- Company personnel (structure, quantity, quality characteristics, etc.);
- Financial resources (equity and debt, generating funds, investment, etc.);
- Structure of the enterprise (the division of responsibilities and work, hierarchy, degree of freedom in decision making, etc.);
- Management system (principles and tools of management, planning, organization, control, motivation, coordination and forecasting);
- System information (database, characteristics, information security, etc.);
- The process of converting raw materials into a finished product (value chain, cost, etc.).

Development of the elements of the internal environment of the organization increases the possibilities and reduces limiting on the activity of the company, and thus contributes to the development of reasonable and timely strategic and operational decisions, which in turn creates and develops the scope of activity of the enterprise.

The scope of the enterprise, which characterizes the activities of the organization in its environment functioning includes, in our opinion, the following elements:

- Finished product (the quality, price, consumer value, etc.);
- The market and consumers (market share, new markets, old and new customers, etc.);
- Position within the industry (competitors, suppliers, distribution system and sales, etc.);
- Technology (technology applied, innovation, novelty, etc.).

Development of the elements of the business sector enables a company to more effectively set strategic and operational objectives, increase productivity and

efficiency of activities of the organization, and provides opportunities for the development of its internal environment.

For their existing conception about the state of the implementation of selected goals for objective measurement of the results of implementation strategy, the management of many Ukrainian machine-building enterprises has used the traditional system of financial- accounting indicators. In our opinion, in today's conditions of development, which has replaced the earlier industrial competition, now it is the time of information competition, meaning that reconsideration is needed of approaches to the formation, control and efficient allocation of financial, industrial, intangible and labor assets of the company. Enterprises need an additional evaluation system, which is linked to accurate and reliable financial evaluation of such intangible assets as market promotion of new products and services, potential ability, experience, interest in employee flexibility, customer loyalty, innovation projects, investment in production and workers, and other assets.

In order to satisfy the needs of Ukrainian enterprises, we are proposing to use the method of Balanced Scorecard (BSC) [5]. BSC complements the financial parameters system which reflect the results of grading the development prospects system of enterprises. Objectives and indicators of the system are formed depending on the ideology and strategy of each organization and consider its activities on four criteria: financial, customer relationship, internal business processes, as well as training and staff development.

Figure 4.2 shows the relationship and subordination between the components of BSC by shapig the strategy of development of a modern engineering enterprise.

This vision is based on the proposed dual structure of potential strategic development of industrial enterprises (including engineering), which combines the current state of the underlying potential and the ability of companies to develop, i.e. the effectiveness of innovative potential.

Thus, in our view, the modern industrial enterprise faces two major tasks: first, creation of a system of indicators, and second, its use as an integrated system of strategic control for their development.

One of the main methods of management for the development potential of industrial enterprises is to develop a system of evaluation and development of methods of assessment on development potential and its prediction to identify the priority capacity of a development enterprise environment.

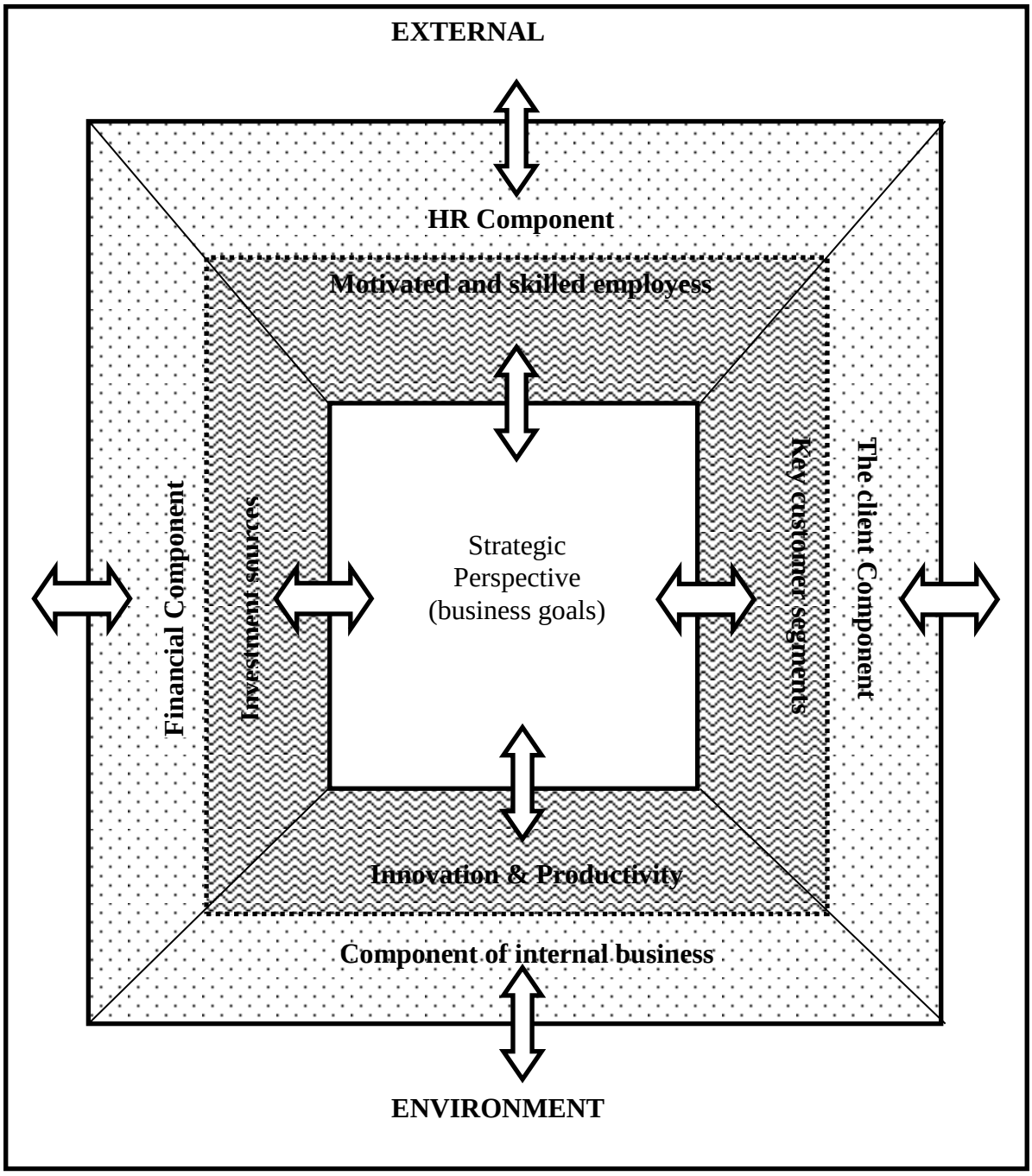

Fig. 4.2. Relationship between components of BSC in the formation of Strategic Perspective

Linkages between business processes and value chains to human resource actions and services were clearly defined as the HR Scorecard became a business tool understood and used across the HR organization. Not only are human capital initiatives needed to increase employee value delivered to the business, they are vulnerable to business process changes and the measures taken in isolation can be misleading.

Importance of HR Scorecard is to obtain information that is contained in the scorecard, and helps to take timely measures promoting business efficiency.

As an example, can be chosen as one of the most important areas of management, from the point of view, the cost of personnel for the company - staff turnover, labor turnover is critical to productivity and cost control. High turnover results are reflected in the poor performance requires higher costs for training. Impact is in all directions and affects the profitability of the business. Using the HR Scorecard, HR professionals monitor and analyze statistical data on turnover, determine the causes of turnover, calculated negative financial consequences, make decisions, monitor the trend of improvement.

As a result, there is a need for quantitative and qualitative assessment of the current (base) potential and capacity for innovation development to guide the process of formation of competitive advantage and provide evaluation and formulation of strategic directions of engineering enterprises.

The HR Balanced Scorecard has made it possible for HR managers to understand how they align to business objectives. They are able to explain not only what they are tracking but also how they are performing on essential strategies for the business. Business environment and the objectives and strategies will continue to evolve, and HR managers will continue to be flexible and creative in supporting the changes.

The value of the HR Scorecard as a tool is that it can get us to the new goals and measures and through the process ensure continued learning and change management. The analysis of the dynamics of integrated indicators characterizing the use of strategic capacity development for local engineering industry indicates the following:

- the existence of negative trends, which is evident in the decline of manufacturing engineering products that are competitive on the domestic and foreign markets;

- formation of negative trends associated with the influence of a rapidly changing external environment and the lack of a clear strategic program for long-term business development in machine-building enterprises and of strategic management of its potential;

- strategic development potential is the most important factor for the economic and strategic security of an engineering enterprise and defines the base for creating a long-term competitive advantage.

- the balanced scorecard approach can provide accurate and timely information about the current (base) potential and the potential for innovative development of engineering enterprises.

We believe that this information will allow for more efficient shaping of competitive advantages and improve strategic decision making at engineering companies. HR Scorecard will allow managers to actively engineering enterprises to improve productivity and achieve strategic goals. In HR Leaders now have a tool that supports the focus on tactical excellence, ensuring alignment with business strategy.

4.2 The practice of competency modelling within the context of human resource development

As an alternative to traditional job analysis, the practice of competency modelling may be useful to managers of human resource development (HRD) to serve as the foundation for many HRD activities.

Asymmetry in economic and social development, instability in its broadest sense, resocialization relationships in the labor sphere, reduced social cohesion, the spread of social exclusion - all these trends, the reality of the new century. And this, again emphasize, it turns out is not the main paradox of our time.

Developing human resources, which accumulate the functions of education, science and technological development, required to satisfy the creative needs of knowledge-based society in all spheres of life and to create the conditions for realizing the principle of life-long education.

Various institutions and organizations should be involved in the development of HR to perform the functions relating to education, process of studying and research, professional training and consulting, as well as various enterprises and organizations where people work and gain the experience and competence in various fields.

Complex systems for developing human resources (HR) should be aimed at satisfying the needs of creating knowledge-based economy. The main features of this system are following.

- Development of HR should be perceived as a continuous complex process embracing a number of processes relating to education and studies of one's professional skills in various areas, carrying out research, individual and group analytical and design work, acting as executor or manager, increasing the competence and skills of acquiring various types of knowledge;

- Development of HR is based on the life-long education' principle, implying that every person can have an opportunity to improve skills to satisfy the requirements of the developing economy, social life, science and technology;

- Development of HR should be the formation of the creative potential for creating the conditions for developing constructive visions;

- Development of HR should be oriented at international priorities, therefore, institutions and organizations involved in the process should operate as international cooperation.

In 1973 was publication McClelland's work that introduced the modern notion of competencies. McClelland acknowledged the critical role that a detailed analysis of the work to be performed should play in developing competencies. To know what effective performance is, he noted, one is required to find out what an individual actually does through a "careful behavioural analysis of the outcomes" and the tasks an individual completes.

Although McClelland's work has had much influence on the development of competency modeling, two related areas of research must also be acknowledged for their contributions: understanding and assessing managerial performance; and the development of core competencies at the organizational level. First, the process of understanding and assessing managerial performance has provided possibility for thought in terms of competencies, rather than tasks.

The work of managers and typically involves more "soft" (i.e., interpersonal) skills, fewer directly observable behaviours, and requires more adaptability in response to changes in the internal and external environments. Such complexity tends to preclude the use of traditional job analysis, which is often task- or activity-focused.

Instead, researchers began to develop alternative methodologies, including the critical incident technique and the related behavioural event interview, to

consideration of behaviour based dimensions of managerial and supervisory performance.

Competencies remain popular and continue to form the basis for a wide range of human resource development (HRD) activities, such as assessment centres, employee development and training, career development, leadership development, managing organizational change, competency typology.

Despite the potential appeal among HRD scholars and practitioners, however, there has been little examination of what competencies are, how they should fit into a competency model, and what the best practices for developing that model ought to be.

Aim of research is to identify the knowledge, skills and competence in engineering, required the labor market and description of trends, design tool for predicting, identification of gaps in specific skills and social competencies.

Development of an integrated educational Training LLL Programme within the Project TEMPUS ««ICo-op»: Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation (530278-TEMPUS-1-2012-1-DE-TEMPUS-JPHES)» should include both the demands of regional labour markets and profile professional degree programs of the partner universities.

We consider issues related to the definition of conceptual clarity determine competence. First, have are the differences in whether a competency should represent some combination of knowledge, skills, abilities, and other characteristics or is more accurately thought of as a behavioral measure or capability. The second aspect pertains to the breadth of what is included in a competency. While some argue for basic knowledge, skills, and abilities, others advocate broader conceptualizations, including motivation, beliefs, values, and interests, or motives, traits, self-concepts, attitudes, and values.

Finally, the definitions tend to differ in the degree to which they explicitly acknowledge the differentiating potential of competencies for high performers, or as being merely useful in achieving work objectives. The differences noted above led Schippmann et al. to conclude that the term competency may have "no meaning apart from the particular definition with whom one is speaking".

Criteria involved: competency modeling best practices or current practices, either from a scientific or applied perspective; competency models applied to a wide range of organizational activities (e.g., human resource development, selection, training,

assessment); and conceptual or review articles focused on definitional issues related to competency modelling, including typologies.

The survey involved 112 employers (survey on 1-4 questionnaires), 66 teachers (of which 36 teachers took part on 2-4 questionnaires, 30 teachers on the fifth questionnaire) and 105 students (undergraduates and postgraduates, participated on 2 - 4 questionnaires).

The survey also took part employers from organizations with different number of employees including research, service, businesses, etc.

Results on "Basic knowledge of the profession" considered as the highest and the lowest - the results on "Ability to oratorical skills and business communications" (Fig. 4.3).

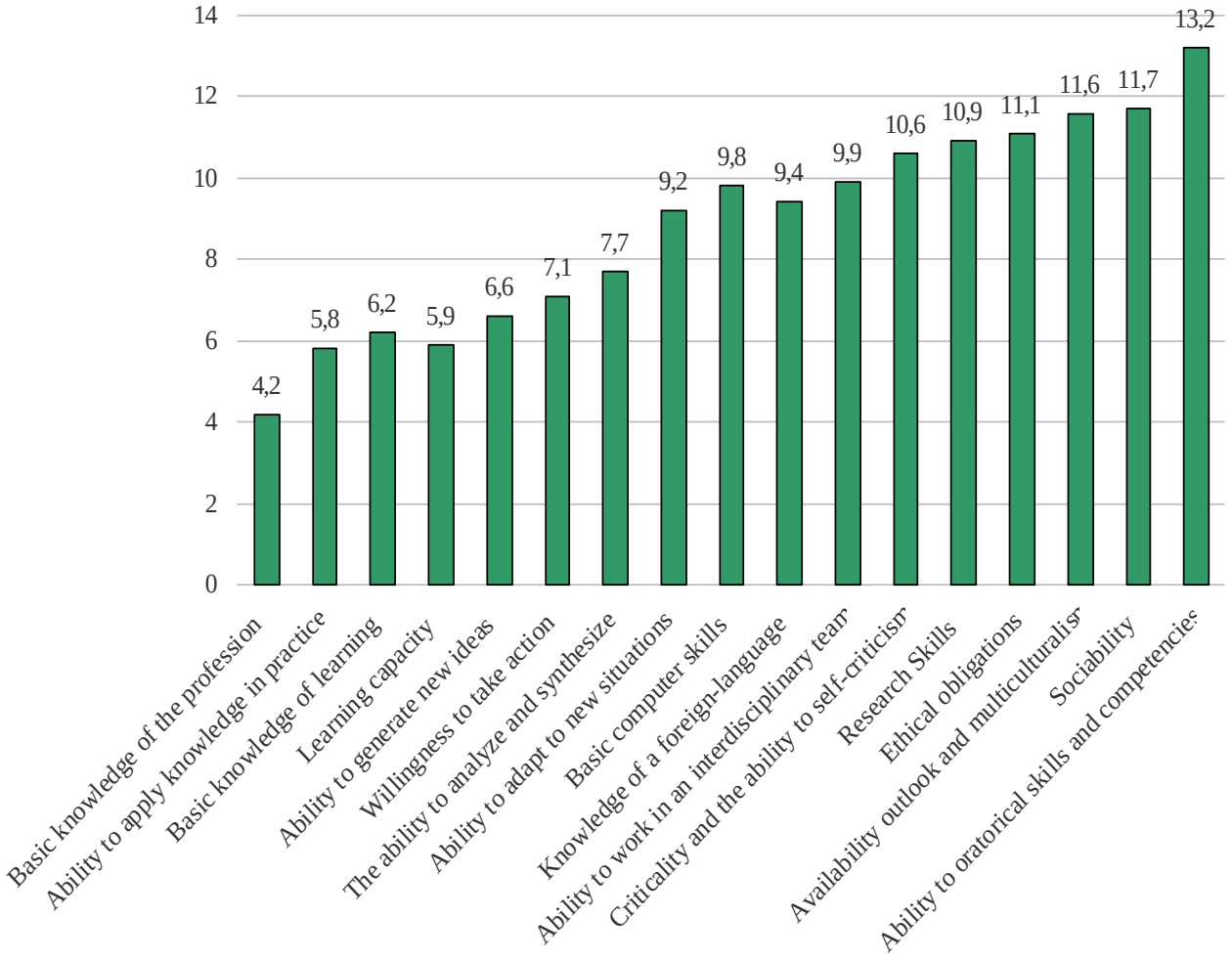

Fig. 4.3. Importance of competence: level of employers dissatisfaction

The results of The identification of specific competences of knowledge for enterprises are presented in Figure 4.4.

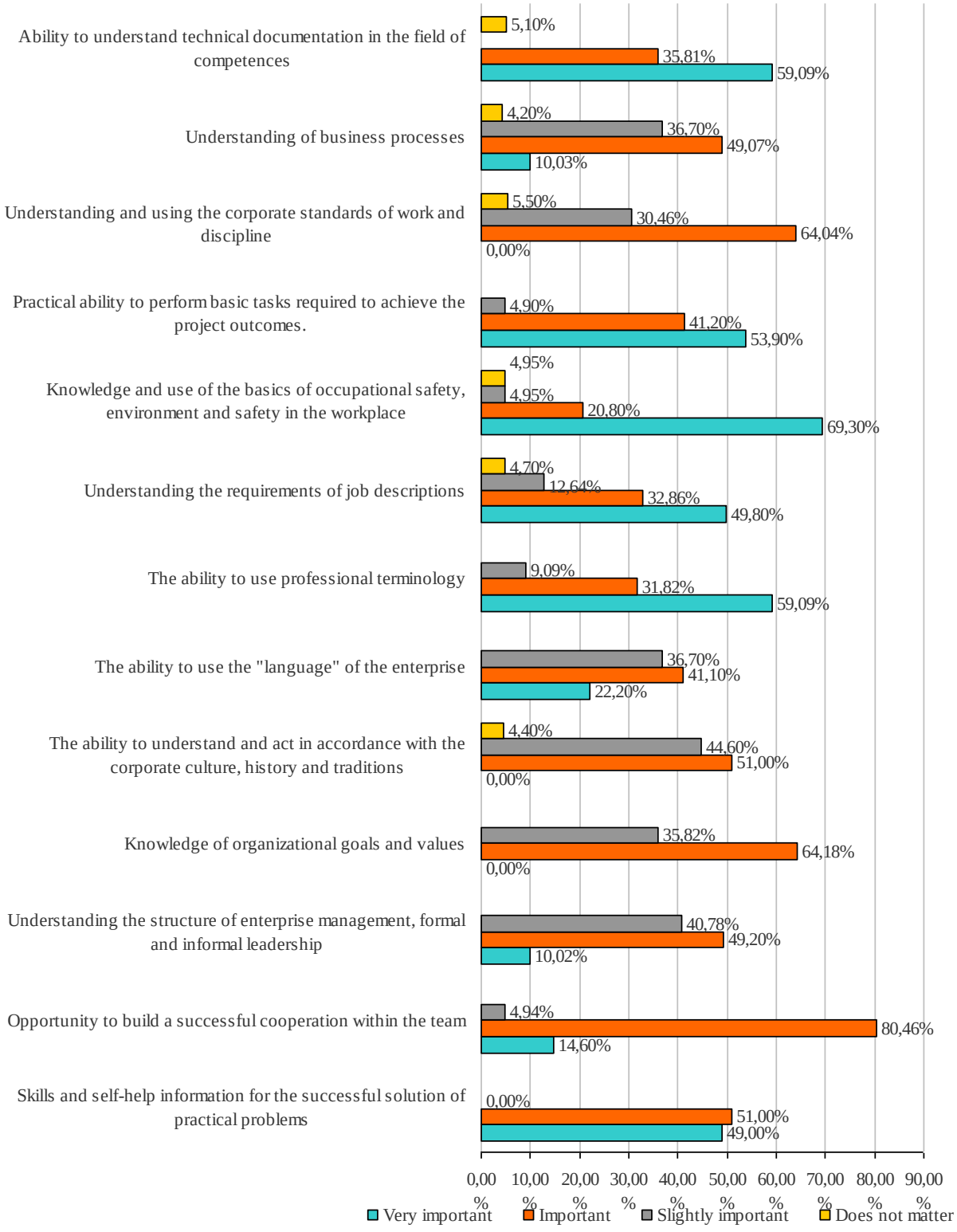

Fig. 4.4. Specific competences of knowledge for enterprises

Two main groups of competencies have been identified that a person, involved in any professional activity, should possess: personal, social-ethical, responsible for the

behaviour of a person as an individual in a social environment; professional, describing the compliance and correspondence of a person to a certain professional activity (science, engineering, etc.).

There is a possibility to identify a special group of additional competencies that are indirectly related to the profession of a person, but the composition of this group can be formed only by experts for every type of activity and it does not bear a systematic nature.

Within each type of competences one can identify certain competencies, which are relevant to the professional sphere chosen by the partner universities.

The urgency to implement remote laboratories and usage of innovative Training programs (including distance ones) is determined by the uneven distribution of regions' scientific-technical potential. That is why it is very important to learn and gain experience of the remote laboratory creation and exploitation in the European partner-countries.

Although traditional job analysis has been positioned as a foundational activity within human resources and organizational development, its applicability to the changing environment of business appears to be limited.

An increasing attention is paid to on strategy of development personnel and human capital as a competitive advantage (Sanchez & Levine, 2012). Popular alternative emerged in the form of competency modelling, which offers several benefits to managers and HRD professionals in particular – serving as the foundation on which training and development programs can be created to encourage superior performance while maintaining a strong link to the overall strategy and direction of the organization. Examining the application of competencies, through competency modelling (and most frequently in contrast or opposition to job analysis), reveals that one must explicitly consider the purposes and goals of the competency model, which drive choices about methodology and implementation (e.g., worker vs. task focus, prescriptive vs. descriptive approach).

Rapid development of information technologies leads to the necessity of constant updating of the curriculum content. Hence, there is a need for joint development of formation system competences of both basic and additional (professional) university programs.

The competence-based approach helps to evaluate the quality of education. Professional functions performed by specialists can be formulated as knowledge and skills received by students. As a result a matrix of competencies is formed.

4.3 Demand and supply forecasting integrated system in professional-competence profile

Current socio-economic and production area focuses in highly specialized personnel.

Education departs from universality and is focuses in quality competence preparation in narrow direction subsequently, corresponding to global practice. The higher educational level, the more informational load must be overcome by the future specialists. At the same time it is reflected in the complexity of redevelopment or change of obtained profession.

The investigation of balanced development of occupational skill structure of supply and demand in the labor market and educational service market is important critical component of the delivering of competitive educational services.

Even today, the problem is especially acute for overcoming the imbalance between graduated specialists in the market of educational services and their correspondence to the labor market.

There are various methods of forecast of labor market needs in the sector context (across the industrial sector). Often, they suffer from lack of comprehensive, methodologically substantiated tools, that can permit deliver adequate practical outcomes based on the theoretical conclusions within the professions.

The basis for the proposed system are the simplest models of branch forecast, followed by decompiling the integrated groups of specialties and areas.

Methodological framework in the first place must be based on information potential of the region. In the second place the tools must provide the flexibility for users, clearly reflecting the processes taking place at the labor market and educational services.

The fundamental task within the framework of the considered this problem is the development of concepts and tools for modeling the supply and demand imbalance at the labor market and educational services in professional-competence profile, structural and meaningful accordance of the education market with the needs of labor market.

The mechanism of the balanced development of labor market and educational services, of which high technology unit is the module of agent-oriented simulation

analysis, will be used in the future. The overview of the mechanism of labor market and educational services feedback is shown in figure.

Main modules are presented separately, they are realized in the integrated analytic unit, which is represented as agent-oriented model in the simulation modelling software environment "AnyLogic". The agent-oriented model, unlike in contradistinction to the forecast trend model, permits the multiple playback of different scenarios of agent behavior, allows to identify the key parameters, affecting the agent behavior, and control them, which makes the model more flexible.

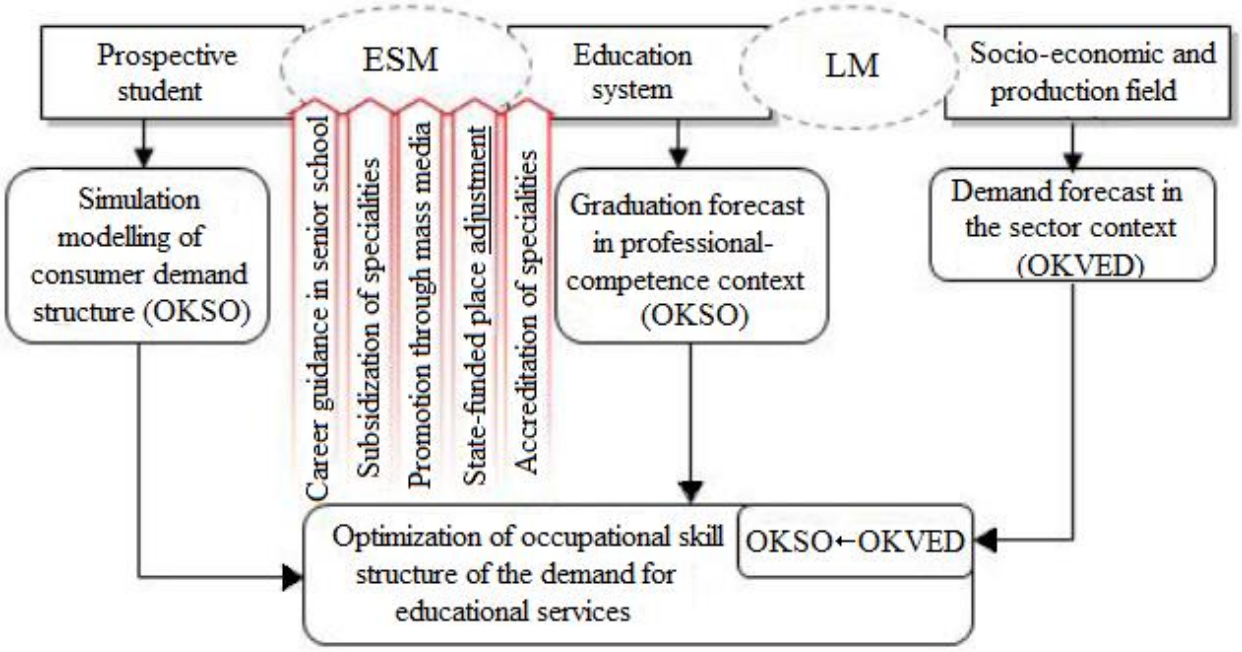

Fig. 4.5. The interaction scheme of educational service and labor market

There is own property set defined to each agent in the model. There is random distribution of these properties for each agent in the model, according to the statistical research results. The agent properties determine the choice of the speciality according to the following measures: the level of wages, the profession prestige, the entrance complexity, the teaching level, the mode of study, the learning complexity, etc. The choice is affected by all the above measures; it differs only in their order of preference. The priorities of making the choice of speciality are specified randomly in the model, according to the social research data. The choice of educational program is based on the principle of filters. There are considered 28 integrated groups of specialities (IGS) in the model. The first filter rejects 7 specialities, the second – 6 specialities and, finally, the last – 2 specialities, as a result there is only one chosen

speciality. The properties of agent and his chosen preference order of measures for making choice of speciality determine his behavior strategy. The measures for making choice of speciality by agent in the model will be interpreted as follows.

The level of wages. At the first stage the semantic connection matrix OKSO-OKVED is formed. At the next stage, groups of specialities are determined, for which graduates obtain the profession being high-paid for current period.

$$\sum_i \left(\sum_j \frac{N}{1000} \cdot p_j \rightarrow \max \right)$$

i : specialities counter;

j : OKVED counter;

N/1000 : the share of specialists in the i-th speciality for j-th OKVED;

p_j : the average monthly nominal charged wages in the context of OKVED.

Profession prestige. It is based on the number of submitted applications for certain speciality. Agent's preferences will be given to those specialities for which is submitted the highest number of applications by the history data.

Entrance complexity. The sample group includes only specialities, which have the lowest entrance score.

Teaching level. This measure permits to elect the specialities with high quality of education.

In the model, the order of preference measures for choosing the future speciality will be assigned to each agent, on the basis of which will be determined the agent's strategy behavior within choosing the studying program.

The proposed agent-oriented model permits to determine the motion of the student flow by the specialities for all educational institutions in the regional market of educational services. All properties and preferences in profession choosing by the agent are based on the probability, derived in this analysis. Behavior strategy of the agent molds on the basis of data properties and preferences. Consequently, each agent will have his own independent behavior strategy.

This model permits attending of the large number of such agents, which makes it the most approximate to the current realities. Thereby, this approach provides the opportunity for modeling the entrance process of students within the certain speciality. Moreover, the opportunity of the impact on various dimensions of estimation of educational institutions and specialities will allow to adjust the student

flow and direct it towards the most shortage specialties according to the current forecasts.

The output values are represented as the matrix of forecast values of requisite quantity of specialists at the labor market. Comparing the obtained result models of demand forecast (employment) and supply forecast (specialists and workers) at the same point of time, it becomes possible to estimate the prospective imbalance.

The proposed model has the self-adaptive ability of internal design factors in terms of historical data and trend changes of input data. Usable user-friendly interface of agent-oriented model makes it easy to use, permits to compile information about individual agents or all users in whole, at any point of time. In addition, there is a capability of data conversion to Excel software product and vice versa.

4.4 Competence diagnostic system of engineering personnel

The diagnosis of professional competence takes placein accordance with requirements of educational standards for each speciality, and individual qualification requirements of enterprises-employers for positions which are occupied by the employees.**Competency certificate** is used for the determination of competency level of particular areas.

The diagnosis of qualifying characteristics can be carried out within a single special subject, a set of subjects or the full course of study.And the process of diagnosis can be characterized as initial, intermediate and final.

In the complex conclusion it must be determined the possibility of closing of the gaps in professional training, its perspective development and its improvement.

Professional education of engineers is based on general professional disciplines.Without these general professional qualifying characteristics is difficult to become a full-fledged engineer.

Rapid development of information technologies has led to changes in requirements to the training of university graduates and new evaluation of their competency.**The standards of training of engineers** must be developed on the basis of these requirements, providing the formation of foundations for future professional activities, such as design and engineering, organizational and management, production and technology, science and research activities.

The development of a culture of the future engineers is inseparable from the development of their spatial reasoning during **the diagnostic, predictive and activeestimating stages**. The achievement of that development is determined by the set of its external and internal conditions and it is carried out at the university as a overall process of formation of imaginative, logical, abstract and creative thinking through solving of diversified problems within educational subjects.

In the current production environment, considering the increasing of competition level, the training of specialistsmust meet the requirements, which become more stringent.

The ability to quick requalification andthe ability to take one's bearings in the torrent of information is largely determined by the level of basic knowledge obtained at the university.The need for personalizationof educational process and the development of creative abilities of students have led to a new direction in pedagogics – creative training.

As institutions of higher education prepare graduates to professional activity due specified to the system of market relations and adapt to rapid changing of the labor market requirements, the fact that they need advanced of plan training which can provide them labor mobility, professional culture and ability of the requalification. Thus integration processes in higher education institutions provide qualitative pedagogical environment for assimilation of other subjects of the curriculum and students participation in design activity.

Concerning the professional training of engineers should be noted that the requirements of state educational standards of higher education must be agreed with corporate requirements for staff qualifications.

The graduate, which obtained engineer specialization in accordance with fundamental and special training, can perform the following types of professional activity: production and technology; organization and management; design and engineering; research and development.

By production and technology activity we mean the following:

– the organization of the operation and operational safety control;

– the organization of production technological process;

– the elaboration of the process control documentation;

– quality supervision of work performance and adherence to technological process;

– effective use of materials and equipment.

Organizational management activity includes:

– the organization of the executive team, management decision making;

– the achieving a balance between different requirements (cost, quality, safety and deadlines) both in long-term and in short-term planning and the definition of optimal solutions;

– the evaluation of manufacturing and nonmanufacturing costs for ensuring product quality;

– the implementation of technical control and quality management by design and production of the products;

– training and certification of operating personnel.

The components of the design and engineering activity are:

– the articulation of project objectives, criteria and ways of achieving those goals, the construction of their relationships structure, identifying of priorities at solving problems according to types of activity;

– the development of generalized alternative among the solutions of the problem, the analysis of these variants, forecasting of the consequences, finding the compromise solutions in terms of multicriteriality, uncertainty, planning of project implementation;

– the usage of computer technology in professional activity;

– the design of new prototype;

– the elaboration of the construction documentation for production and repair, modernization and modification of the products;

– the development of projects of engineering specifications, standards and technical descriptions;

Research and development activity of engineers contains:

– information retrieval and data analysis in accordance with subjects of research;

– analysis of the position and dynamics of economic activities with the use of appropriate methods and analysis tools;

– simulation of processes or phenomenons;

– development of plans, programs and methods of research conducting;

– technical, organizational support and implementation of research;

– research analysis and proposal development of application for its results.

4.5 The development of professional competencies of future engineers under the conditions of integration process of education, science and industry

High level of competition among specialists has formed new factor conditions of employment of the personality as a competitive specialist. The scale and density of information flow of new knowledge accelerates the process of moral "aging" of the theoretical foundation that forms the basis of the individual readiness for professional activity during the training stage at higher educational institutions.

In recent years, new educational paradigm has been formulated, under which the quality of modern education determines by level of competency obtained at higher educational institution; it is the ability to determine connections (establish a correspondence) between knowledge and situations, and adequately apply knowledge for solving problems. Quality control of engineering and technical education cannot be reduced only to the evaluation and control. It presupposes also the creation of the set of conditions ensuring that quality. One of the components of this set is the integration of engineering and technical education with science and industry.

The integration of engineering and technical education with science and industry is dynamic multicomponent system. Each state of system, corresponding to certain connection between its components, provides some form of integration.

However, protracted economic crisis has resulted to considerable lag in the development of science, industry and education in Armenia, Georgia and Ukraine, in comparison with the EU countries and the emergence of technological and information gap between them. These conditions require the development of new approaches, forms and methods of engineering and technical education, based on the traditions of national education, pedagogical innovations and advanced experience of number one countries.

For the university, this means the need for development and implementation of techniques, that would ensure for future engineers comfortable environment in terms of goals of personal and social development. It is possible if there is intentional development of comprehensive personal needs in **the ombination of narrow professionalism with universalism** in educational process. Their optimal combination can provide the competitiveness for the person and future specialist in

labor market and the competitiveness for higher educational institutions in the market of educational services.

Even so, the developments, which can provide the opportunity to develop conceptually new solutions that can allow within existing system of higher education to use the potential of integration of education, science and industry in the training of competitive engineers, based on competence-oriented approach, still are not presented in the scientific and teaching literature.

Thereby, **contradictions emerge** between:

– increased requirements to the integration processes in the system of "Education – Science – Industry", which provide integration of multicomponent scientific and production cycle, and insufficient reflection of these processes in the content of higher engineering education;

– the advisability of using the potential of integration of education, science and industry for obtaining of professional competencies and insufficient development of this issue in the theory and practice of professional pedagogics.

The development of professional competency of the future engineers under the conditions of integration of education, science and industry will be more effective if the following requirements are carried out:

– the development of unified educational space between the university, science and industry, which allows to form system professional knowledge, underlying the professional competences, in which the achievement of the embeddedness of integration into the training process for future engineers is based on their orientation to professional activity in accordance with obtained speciality;

– model development of integration of education, science and industry, based on general and pedagogical principles, reflecting the goals, objectives, factors of technical education, the content of professional training of future engineers; which determines the direction of the development of competent person as the engineer and gives the opportunity of the evaluation of professional competences;

– the training process of future engineers is based on the integration of knowledge, scientific achievements and practices at all stages of specialist training and allows to implement in practice the integration of the components of professional competencies and to simulate (model) in the learning process the integrated nature of future professional activity;

– ensuring of the processability of the educational process on the basis of the adaptation of the famous pedagogical technologies to university conditions, the construction of new technologies based on competence-based approach coupled with the competitiveness characteristics of the future engineers.

The methodology of educational projects, based on the use of advanced laboratories equipped with remote access, facilitates the transition from the traditional approaches to competency and activity training approaches; it can be used as orientation basis for the development of modern educational programs.

Modern education program of engineers must be based on the following components:

1. Integration of education, science and industry – structure-forming component of unified educational space, which allows to develop system professional knowledge underlying the professional competences.

2. Integration efficiency is achieved under the condition of quality relationships of educational, research institutions and industry.

3. The high level of professional training quality is achieved under conditions of carrying-out of requirements of the subjects of integrative interaction between education, science and industry.

4. The competitiveness of future engineers and their orientation to professional activity in accordance with obtained speciality is provided under the conditions of the embeddedness of integration of education, science and industry into the training process.

5. The model of integration of education, science and industry, based on general and pedagogical principles, which determines the orientation of technical higher education on the interests of a person as future engineer, the development of erudition, professional competencies, creativity and basic culture of behavior; it allows to determine the directions and conditions of pedagogical process improvement, based on monitoring and forecasting, the establishment of labor market feedback.

The organization of elements of "Education – Science – Industry" system determines the development of various forms of informational interaction.

The management of the development of integration processes at the university is achieved through efficient interaction of all concerned organizations and includes:

– educational process organization in accordance with the requirements of employers to the qualification of graduates;

– the evaluation of professional training quality by independent expert commissions by means of tests, compiled in conjunction with employers;

– the certification of qualifying requirements of graduates;

– the implementation of innovative educational technologies in the educational process, firstly it includes modular competency approach; the organization of industrial practice for students on the modern equipment under production conditions; variative forms of social partnership.

6. Multidisciplinary integration of "Education – Science – Industry" system ensures by:

– the definition of multidisciplinary goals and objectives of training process;

– carrying out of horizontal and vertical integration of disciplines;

– the identification of multidisciplinary connections within separate blocks and between major blocks of disciplines;

– the identification of subjects, which form the main basic definitions;

– structurization and compilation of the system of disciplines and semantic concepts;

– the determination of educational process order for different levels of training, if it’s theoretical and practical part is based on solving of professional-oriented tasks during training program, which ensure the development of professional competencies and allow to obtain relevant professional knowledge and skills.

Integrated program content allows to create complete view of the profession and to develop systematic professional knowledge as the basis of professional competence. Integrated courses orientation on the development of professional reflection contributes to comprehension of essential characteristics of professional activity by students.

7. Competence-oriented methodology of training of competitive engineer specialist, based on reflexivity, modularity, dynamism, flexibility, perspective awareness, parity, significantly improves the quality of training of engineers, provides proper level of technical, functional and general knowledge, perseverance, complaisance, initiative, developing technical skills, forms engineering thinking.

The components of this technology are:

– the goal, which lies in development of professional engineering competence and the personality of an engineer;

– the content, which is reflected in author programs of developed network of educational-methodical complex of training courses;

– teaching tools including professionally-oriented task complex in the educational process of students of training modules, which contribute to efficient development of professional competencies;

– the applying of interactive computer programs;

– the motivation, provided by the methods of active training forms in complex with the application of team-work methods:

– management, including imitational mechanism of training activity organization, business simulation games, remote laboratory works, projects, which forms the cross-cutting foundation throughout the training period;

– the application of network approach in the development of training programs;

– expert evaluation component, which includes the methodology of the determination of obtained professional competence indexes.

The prospects for further sustainable development involve the improvement of the methodology of main professional competencies selection, the development of modular integrated programs of the formation of these competencies and the development of relevant techniques for their monitoring. The forecasting will be provided by carrying out of researches with a periodicity not less than once in every three years.

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CONCLUSIONS

Sustainable progressive social-economic development of the country, its leadership position in the external market is ensured by the developed "knowledge generation" environment. The latter is based on the significant sector of fundamental research, availability of effective educational system, developed innovation system as well as state policy directed to the stimulation of innovation activites.

The changes taken place in the sphere of labour and employment, necessity to solve economic problems having the aim to make enterprises competitive and efficient, rapid and adequate response to the changes associated with the development of the new technologies require respective organization of engineering work and, therefore, special attention to higher technical education.

The principle of designing a employee reference model has been used during training of qualified specialists. This principle demands a combination of qualitative and quantitative methods of the sociological analysis. The qualitative methods include personal interviews, work with focus groups and mini groups. The quantitative method is carried out in the form of a survey representing information gathered from respondents via questionnaires.

The requirements for the standards of technical education should be formed by market demand of specialists with a clear list of competencies. Having compared the list of necessary competencies for a specialist in a particular subject area (specialist model) with the list of planned competences of a graduate student in his\her major within the same subject area (graduate model), the partner universities will be able to train specialists who will meet the labour market requirements.

Formation of graduates' professional competences of including labour market requirements could be achieved at the expense of social partners. Social partnership - is a special type of interaction between educational institutions and employers, having the aim to achive a maximum harmonization and implementation of the interests of all participants in the educational process.

Social partnership is carried out due to the following functional responsibilities:

- On behalf of the educational institution:

• organization of social dialogue;

• development and presentation of education programs and curricula;

• development and introduction of the offers related to the changes of Professional Standards;

• self-management of educational programs.

- On behalf of employers:

• planning of the specialist demand;

• participation in the development of Professional Standards;

• motivation for training of qualified specialists;

• quality control of graduates;

• assessment of the graduates training quality dueto the Professional Standards confirmed by all the participants.

Two main groups of competencies have been identified that a person, involved in any professional activity, should possess:

• personal, social-ethical, responsible for the behaviour of a person as an individual in a social environment;

• professional, describing the compliance and correspondence of a person to a certain professional activity (science, engineering, etc.).

There is a possibility to identify a special group of additional competencies that are indirectly related to the profession of a person, but the composition of this group can be formed only by experts for every type of activity and it does not bear a systematic nature. Within each type of competences one can identify certain competencies, which are relevant to the professional sphere.

Rapid development of information technologies leads to the necessity of constant updating of the curriculum content. Hence there is a need for joint development of formation system competences of both basic and additional (professional) university programs. The competence-based approach helps to evaluate the quality of education. Professional functions performed by specialists can be formulated as knowledge and skills received by students. As a result a matrix of competencies is formed. This scheme combines economy and education and allows students to choose educational trajectory.

The positive experience, which is accumulated during implementation of the TEMPUS project ICo-op will significantly increase learning efficiency and improve the quality of students professional training program to the level of international labour market standards and requirements.

All that has been described in this book highlights the fact that Ukraine is a European country and that it is necessary to integrate into the European architecture.

ANNEXES

METHODOLOGY OF QUESTIONNAIRES AND SURVEYS

The research program

The object of study: the labor market in Georgia, Armenia and Ukraine on the example of the targeted region (Kharkiv, Ivano-Frankivsk, Zaporozhye, regions of Ukraine, etc.).

Subject of study: engineering professions in the labor market in Kharkov.

Purpose of study: to compare the current situation and trends in the labor market of engineering occupations in Kharkiv, Ukraine and the former Soviet Union regions.

Tasks	Indicators	The methods used	Results
1. Describe the state of the engineering professions market	- number of engineering positions (specializations, industries, levels of training) - the number of vacancies - the number of applicants - the number of graduates who have received engineering, - supply and demand (vacancies and job seekers) - characteristics of engineering positions / jobs (basic requirements, salary, working conditions) - portraits of the engineering professions (gender, age, education, work experience, job responsibilities)	- analysis of statistical data - expert survey specialists of public employment services - expert survey specialist recruitment companies regions - expert survey specialist employment centers targeted universities	market report
2. Identify market trends engineering professions	- predominance of the supply / demand - reduction / increasing - specialization / universalization - the emergence of new professions / disappearance of old - demographic trends - Trends in earnings - strengthening / weakening of the gender segregation of	- expert survey specialist employment services - expert survey of employers - the survey of students - factor analysis	Description of trends and design tool for predicting

Tasks	Indicators	The methods used	Results
	labor - key factors influencing the labor market engineering professions (economic, scientific, technical, demographic, social, environmental, legal and other) - Globalization and emigration		
3. Identify the degree of satisfaction with the needs of employers in the quality of labor force of engineering professions specialist	- Describe the basic requirements for the technical personnel engineering education - Identify gaps in the special training of engineers at the moment - Identify gaps in the transversal competences	- Expert survey of employers - Focus group with representatives from departments	Identification of gaps in specific skills and transversal competences
4. Analysis of the interaction between business and education	- Needs of educational institutions, in collaboration with the business - Business needs in collaboration with educational institutions - The comparison of the state employees, employers, teachers and students about the requirements for engineers	- Expert survey specialist employment services - University-business (a survey of all major departments of universities)	Developing a model of interaction of the university and business

Focus group with professors from the pilot departments

Goal: to define special and transversal competencies needed for professionals of certain profiles.

Duration: 1 – 1.5 hours

Number of participants: 6 – 12 persons

Human resources: a moderator and a record-keeper.

Moderator:

- creates informal atmosphere,
- focuses group's attention on a certain topic,
- switches attention from one topic to another,
- manages group dynamics,
- provides an opportunity to express own opinion to each participants,
- avoids value judgments,
- composes a final report on focus group results.

Record-keeper:

- writes down all the ideas not only those which are interesting for him/herself,
- observes reaction of participants and asks questions following the moderator's requests,
- composes a draft report on focus group results using own notes and audio record.

Requirements:

- premises is adequate to the number of participants,
- participants seating in a circle so all the participants could see and hear each other,
- badges with names to call participants by names,
- Dictaphone,
- paper and pen,
- tea/coffee to create informal atmosphere,
- camera to take pictures.

Scenario

Dear participants, I'd like to thank you for finding time to participate in the focus group. You probably know that in the frame of TEMPUS Project **Industrial Cooperation and Creative Engineering Education based on Remote Engineering and Virtual Instrumentation** some educational modules will be developed to improve engineering education. We invited you to listen to your opinions concerning knowledge and skills which are a must for graduates and therefore to understand what modules are in demands.

My mane is …, I'll lead the meeting, I'll be assisted by …, he/she will take minutes of the meeting, and also we'll keep audio records not to miss any of your thoughts.

Let's agree on the rules of behavior during the meeting:

- Please be so kind to switch off your mobile phones,
- Express your thoughts and don't criticize other's ones even if you consider them as absurd,
- Be active but also give an opportunity to others to express their opinions.

Is this OK with you? If you have another suggestions please tell us.

Let's start our work.

Please introduce yourself and say what courses you teach.

What should graduates from your department know?

After all the participants finished their answering you need to pause and clarify whether all the knowledge was recalled.

What should graduates from your department be able to do (what skills)?

After all the participants finished their answering you need to pause and clarify whether all the skills were recalled.

What transversal skills are the most important for your graduates?

What skills does the majority of your graduates really acquire?

Development of what skills do generate problems? Why?

How does your department cooperate with enterprises and companies? What problems do you face in the course of the cooperation?

Let's sum up. If you have any ideas concerning the topic of our discussion you have the last opportunity to voice them.

Thanks a lot for your time and your thoughts!

Questionnaire for employers interview

In one of the previous studies Business Administration and Personnel Management Department of NTU "KhPI", were the **groups of competencies and skills**, the following as the most important for professional development and adaptation of university graduates.

Our team of TEMPUS ICo-op plans to expand the study to improve monitoring and to meet the expectations of the labor market in Armenia, Georgia and Ukraine.

We aim to understand better your needs as an employer, so please take the time to answer the questionnaires.

Main goal - is to identify the knowledge, skills and competence in engineering, required the labor market.

Your responses will not be divulged and will only be used for the planning of the training component of the project.

Based on the survey results, the specialists of the project will be to develop a comprehensive training program for you and your business.

THANK YOU FOR YOUR THOUGHTFUL ANSWERS!

1. Please specify the country: _____

2. Please specify to which type of economic activity belongs your enterprise (organization): _____

3. How many persons currently working at your company (organization)?

☐ 1-20 ☐ 51-100 ☐ 151-200

☐ 21-50 ☐ 101-150 ☐ > 250

4. Where is situated the capacity of your company (organization)?

☐ Under local production (in the same city, within one area)

☐ Regional production (manufacturing facilities are located in several cities in one or five areas)

☐ Production on a national scale (manufacturing facilities are located in more than five areas)

☐ International production (manufacturing facilities are located in more than one, and in at least two countries)

5. Specify the level of turnover of your company (organization)

☐ <50.000 € ☐ 500.000 – 1.000.000 €

☐ 50.000 – 200.000 € ☐ < 1.000.000 €

☐ 200.000 – 500.000 €

6. Enter your first and last name

_____

7. Enter your contact details

_____

8. Enter your enterprise (organization)

_____

9. Specify the type of your organization

☐ beginner
☐ new round
☐ existing _____ years

10. What features do you do?

_____

11. How important do you think is the learning process for the overall development of your enterprise (organization)?

☐ It is very important
☐ important enough
☐ Not at the moment
☐ Not important

12. How learning / training can affect for you and your company (organization)?

☐ To raise awareness
☐ Increase the level of knowledge transfer
☐ There will be a change in attitude / behavior of employees
☐ Increase the level of exchange of information and best practices
☐ There will be an exchange of views
☐ Workers acquire new skills
☐ There will be improvement in the enterprise
☐ Employees will be more loyal to the enterprise
☐ Increase the level of liability and reliability of workers

Questionnaire on general skills and competences

Please rate the 17 competencies in order of importance according to your opinion (**1 - most important, 17 - the least important**).

It is important that you rank all 17 points (equal rating can not be assigned).

General competence	Ranking
1. Ability to work in an interdisciplinary team	
2. The presence of outlook and multiculturalism	
3. Basic knowledge in the field of learning	
4. Basic knowledge in the field of the profession	
5. The ability to analyze and synthesize	
6. The potential for applying knowledge in practice	
7. The potential for generating new ideas (creativity)	
8. The ability to adapt to new situations and conditions	
9. Learning capacity	
10. Criticality and the ability for self-criticism	
11. Willingness to decigion making	
12. Basic computer skills (word processing, working with databases and other tools)	
13. Ethical commitment	
14. Communicability	
15. Knowledge of a foreign language	
16. Public speaking and written communication in the native language	
17. Research skills	

Add here any comment that you consider useful for the study:

_____

_____

_____

_____

_____

Please check the rating on all 17 counts

Please go to the second questionnaire!

Questionnaire identifying specific competence knowledge for companies

Below are the specific competencies of knowledge. For each of them:

a) specify, in your opinion, that the student should acquire competence in his / her education in the **first cycle of education (Bachelor), as determined in accordance with the Bologna process**. Please use the values from 1 to 4 according to the following key:

1 = Does not matter
2 = Slightly important
3 = Important
4 = Very important

b) specify, in your opinion, that the student should acquire competence in his/her education in the **second cycle of education (Master), as determined in accordance with the Bologna process**. Please use the values from 1 to 4 according to the following key:

1 = Does not matter
2 = Slightly important
3 = Important
4 = Very important

c) indicate, in your opinion, that the student should acquire competence in his/her education in the **third cycle (Postgraduate), as determined in accordance with the Bologna process**. Please use the values from 1 to 4 according to the following key:

1 = Does not matter
2 = Slightly important
3 = Important
4 = Very important

Special Competence	**The value for the first cycle (Bachelor)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the second cycle (Master)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the third cycle (Postgraduate)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
1. Ability to apply knowledge of mathematics, physics, chemistry and other physical sciences			
2. Systematic approach to the solution of specific problems			
3. Ability to identify, formulate and solve specific problems			
4. Requirements analysis and creation of technical conditions for the development of the project (for example, requirements for materials, energy, efficiency, functional characteristics, technologies, etc.)			
5. Ability to analyze and provide the quality requirements of the project			
6. Ability to analyze and provide energy-saving measures			
7. Ability to analyze and ensure measures for occupational health and safety			
8. Basic knowledge of technical systems development (eg, the use of functional principles, modeling, numerical methods, etc.)			
9. The ability to perform functional tasks for the design of technical systems (eg, system design structure, process simulation)			
10. Ability to carry out detailed tasks of complex systems (for example, for technical systems - detailed design of the components of the system)			
11. The ability to perform operational tasks			

Special Competence	**The value for the first cycle (Bachelor)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the second cycle (Master)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the third cycle (Postgraduate)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
(eg, technical systems - choose production methods, techniques, flow charts, tools and equipment, etc.)			
12. Basic knowledge of base technologies in the key industry (for example, ordinary technologies, innovative technology, nanotechnology, etc.)			
13. Opportunity to carry out the planning process (for example, the introduction of a production flow chart)			
14. Ability to select the tools and the formation of a quality control system that will meet the specific project			
15. Basic knowledge of logistics in a particular industry (eg, supply of raw materials, equipment, and the energy required for the production process)			
16. Understanding of current and new technologies and their impact on new / future market			
17. Basic knowledge on the ecology and the environment (eg, knowledge of national and international regulations, procedures for environmental requirements)			
18. Basic knowledge of the use, disposal and environmental impact			
19. The ability to use life-cycle analysis of the product (for example, the impact on the environment, life cycle assessment)			

Special Competence	**The value for the first cycle (Bachelor)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the second cycle (Master)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the third cycle (Postgraduate)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
20. Knowledge and ability to perform tasks on afterdesigned stage (eg, maintenance and reliability, principles and methods, planning)			
21. Basic knowledge of modeling, simulation and analysis tool processes and systems (eg, methods, software, procedures)			
22. Ability to carry out modeling, simulation and analysis of technical systems (eg, modeling of processes in different modes of operation, modeling and analysis of engineering systems)			
23. The ability to create real prototypes and design of experiments in a virtual environment using professional software			
24. Knowledge of measurementmethods (for example, direct methods, indirect methods, procedures, data collection, processing and storage, etc.)			
25. Knowledge of metrological standards of industry			
26. Ability to apply knowledge to use monitoring system (for example, a circuit measurement, online monitoring, functional parameters of the system)			
27. Ability to develop and implement maintenance schedules			
28. Knowledge of basic terminology, organization of production processes			
29. Knowledge of specific programming languages or software			

Special Competence	**The value for the first cycle (Bachelor)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the second cycle (Master)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the third cycle (Postgraduate)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
30. The development and implementation of information systems for enterprises			
31. Skills in information technology (eg, word processing and spreadsheets, registration, use and storage of data, etc.)			
32. Knowledge management instrumentation of planning systems and controlling (eg, strategic planning, benchmarking, TQM, etc.)			
33. Understanding the principles of management and their relationship with the business knowledge (eg, operations management, project management, information technology)			
34. Knowledge of industry and business law, and the ability to communicate with the business / management / technical knowledge			
35. Understanding of and commitment to professional and ethical responsibility in the company			
36. The ability to recognize and analyze new problems and create a plan strategies to solve them			
37. Critical analysis, synthesis, and generalizing of information, including a preliminary study			
38. Receipt and distribution of the various sources of information (such as text, numerical, verbal, graphic)			

Special Competence	**The value for the first cycle (Bachelor)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the second cycle (Master)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The value for the third cycle (Postgraduate)** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
39. Preparation, processing, interpretation and presentation of data, using appropriate qualitative and quantitative methods and packages (for example, statistics, Power Point)			
40. Skills in evaluation, interpretation and synthesis of information (eg, report writing, preparation of presentations)			
41. Presentation skills of scientific materials and their arguments in writing and orally to a professional audience			
42. Understanding the principles of operation of the organization			
43. Competence at your discretion			

Please check that you have answered all the questions and go to the third questionnaire!

Questionnaire on practical skills for companies

This questionnaire is a series of questions related to the skills and competencies that are the result of passing students practice in the workplace.

Please answer all questions.

Please select the correct / best option in each case using the following scale:

1 = Does not matter
2 = Slightly important
3 = Important
4 = Very important

Skills and competencies	**Importance** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	**The extent to which developed higher education** 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
1. The ability to understand the technical documentation in the field of competence		
2. Understanding of business processes		
3. Understanding and use of corporate standards and discipline		
4. Ability to perform basic practical tasks necessary to achieve the results of the project (for example, operating, computing, measuring, etc.)		
5. Knowledge and use of basic safety, the environment and safety in the workplace		
6. Understanding of the requirements of job descriptions		

Skills and competencies	Importance 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important	The extent to which developed higher education 1 = Does not matter 2 = Slightly important 3 = Important 4 = Very important
7. The ability to use professional terminology		
8. The ability to use the "language" of the company		
9. The ability to understand and act in accordance with the corporate culture, history and traditions		
10. Knowledge of organizational goals and values		
11. Understanding the structure of the enterprise management, and formal and informal leadership		
12. Ability to successfully build cooperation within the team		
13. Skills learning and searching for the successful solution of practical problems		
14. Enter the new competencies		
15.		
16.		
17.		
18.		

19. Please specify what you think is useful for the professionalization of teaching:

20. What, in Your opinion, the main benefit for your company to cooperate with the university? (Specify up to three)

1. Allows efficient recruitment policy
2. Allows the function of staff development

3. Reduces costs
4. Increases efficiency
5. Allowing a faster response to customer needs
6. Increases innovate
7. Allows access to new markets
8. Increases profitability
9. Other (specify)

21. What can lead you to an understanding of the need to cooperate with the university?
1. Need for special knowledge
2. I was approached by university staff
3. Existing contacts
4. Advice from a business partner

22. In Your opinion, what are the main barriers to co-operation with the university? (Specify no more than two options)
1. Finding the required person
2. Finding scientists who understand the needs of the enterprise
3. Explanation for my needs scientists
4. Overcoming the bureaucratic rules of the University
5. Implementation of the solution in the existing systems/processes
6. Financing activities

23. How would you estimate the level of practical knowledge and skills acquired during education?
1. unsatisfactory
2. insufficient
3. satisfactory
4. high
5. very high

24. Do you think that the students received during the training, knowledge and skills are adequate from the point of view, the expectations of the labor market?
1. insufficient relevant
2. Correspond to a certain extent
3. Correspond mainly
4. match with expectations
5. exceed expectations

Thank you for filling out the questionnaire!

Questionnaire on training needs assessment

The main goal of this study is to identify the knowledge and skills most needed you, your staff and graduates in technical disciplines.

Fill in the fields, which will improve the skills, competencies and knowledge of your work (increased contribution to the productivity of your work).
Rank of each field is determined by its importance to your work - 5,4,3,2,1.
Assess personal level of skills / competencies for each field.
5 - a high degree of importance.

	Knowledge and skills	**Importance (5,4,3,2,1)**	**Personal level (5,4,3,2,1)**	**Comments**
1	**Subject area 1 (basic knowledge) (determined by the results of focus groups)**			
1.1	Skills and competencies (determined from the results of focus groups)			
1.2.	- // -			
1.3	- // -			
1.4	- // -			
1.5	- // -			
1.6	- // -			
1.7.	Other, please specify			
1.8.				
1.9				
1.10				
2	**Subject area 2 (basic knowledge) (determined by the results of focus groups)**			
2.1	Skills and competencies (determined from the results of focus groups)			
2.2.	- // -			
2.3	- // -			
2.4	- // -			
2.5.	- // -			
2.6.	- // -			
2.7	Other, please specify			

	Knowledge and skills	**Importance (5,4,3,2,1)**	**Personal level (5,4,3,2,1)**	**Comments**
2.8				
2.9				
2.10				
2.11				
3	**Subject area 3 (specialized knowledge) (determined by the results of focus groups)**			
3.1	Skills and competencies (determined from the results of focus groups)			
3.2	- // -			
3.3	- // -			
3.4	- // -			
3.5	- // -			
3.6	- // -			
3.7	Other, please specify			
3.8				
3.9.				
3.10				
4	**Subject area 4 (specialized knowledge) (determined by the results of focus groups)**			
5	**Subject area 5 (specialized knowledge) (determined by the results of focus groups)**			
6	**Subject area 6 (specialized knowledge) (determined by the results of focus groups)**			
7	**Subject area 7 (specialized knowledge) (determined by the results of focus groups)**			
7.1				
7.2				
8	**Development and support of small and medium business innovation (transversal knowledge)**			
8.1	R&D and innovation in the business sector			
8.2	Detection and identification of innovative ideas			
8.3	Marketing of innovation			
8.4	Business modeling of innovative enterprise			
8.5	Commercialization of innovations			
8.6	Innovative management			

	Knowledge and skills	**Importance (5,4,3,2,1)**	**Personal level (5,4,3,2,1)**	**Comments**
8.7	Business planning/financing of innovative projects			
8.8	Quality management in innovative enterprises			
8.9	Personnel management of innovative enterprises			
8.10	Corporate social responsibility			
8.11	Other, please specify			
8.12				
8.13				
8.14				
9	**Intellectual property**			
9.1.	International Intellectual Property Law			
9.2.	International patent search and patent inventions in foreign countries			
9.3.	Commercialization of intellectual property			
9.4.	Management of intellectual property rights			
9.5.	Intellectual property rights in business			
9.6.	Evaluation of intellectual property rights			
9.7.	Protection of intellectual property rights: civil, administrative, criminal, etc.			
9.8.	Taxation of Intellectual Property			
9.9.	Other, please specify			
9.10.				
9.11.				
9.12.				

Please add any other comments/suggestions or ideas that you would like:

_____

_____

_____

_____

Thank you for your cooperation!

НАУКОВЕ ВИДАННЯ

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ПОПИТ І ПРОПОЗИЦІЯ НА РИНКУ ПРАЦІ: прогнозування, розвиток персоналу, організаційно-поведінковий аспект

МОНОГРАФІЯ
За редакцією проф. О.І. Савченко

Англійською мовою

Відповідальний за випуск П.Г. Перерва
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